

Refrigeration Service Engineer

VOL 15 NO. 7

★ ★ ★

JULY • 1947



20 New CHICAGO VALVE PLATES

- CS No. COMPRESSOR
- 540 APEX
- 725 BRUNNER
Models: S-140, R330
- 726 BRUNNER
Model: R500
- 728 COPELAND
Model: 21
- 509 FAIRBANKS-MORSE
Models: BS6, B-8
- 509 GALE
- 560 GALE
- 509 JOMOCO
Models: RC6 1/5 H.P.
- 560 JOMOCO
Models: RC5 1/6 H.P.
- 730 KELVINATOR
Model: K

- CS No. COMPRESSOR
- 731 KELVINATOR
Model: Y
- 735 M & E
- 724 PAR
- 509 STEWART-WARNER
Models: 1934 to 1938 inclusive
- 720 SUPERCOLD
Model: E
- 732 UNIVERSAL
Models: K, L, M
- 566 WILLIAMS
Models: C75, H
- 567 WILLIAMS
Models: D100, F150, V200, V300
- 568 WILLIAMS
Model: A
- 565 YORK
Model: LG-2

FOR BETTER PERFORMANCE

These 20 New Valve Plates are Designed to Fit 37 Compressor Models. This Greatly Increases the Scope of Your Service on Compressor Repairs.

ASK FOR THEM AT YOUR
REFRIGERATION
WHOLESALE



**REPLACEABLE SEATS
ARE EXCLUSIVE WITH
CHICAGO VALVE PLATES**



CHICAGO SEAL CO.

20 N. WACKER DR., CHICAGO 6, ILL.



REFRIGERATION'S BIGGEST PROBLEM!

DRYING POWER OF VARIOUS MATERIALS

Drier	Refrigerant	Liquid or Vapor	Max. Residual Water Concentration After Passage through Drier.	
			.35% Initial Water Concentration	.03% Initial Water Concentration
ACTIVATED ALUMINA	Sulfur Dioxide	L	.15	.005
		V	.01	
SILICA GEL	Methyl Chloride	L	.01	.006
		V	.01	
DRIERITE (Calcium Sulphate)	Sulfur Dioxide	L	.15	.006
		V	.08	
CALCIUM CHLORIDE CaCl ₂	Methyl Chloride	L	.05	.003
		V	.04	
CALCIUM OXIDE CaO	Sulfur Dioxide	L	.09	.013
		V	.01	
BARIUM OXIDE BaO	Methyl Chloride	L	.10	.005
		V	.04	
	Sulfur Dioxide	L	.20	—
		V	.15	
	Methyl Chloride	L	.15	—
		V	.08	
	Sulfur Dioxide	L	.20	.017
		V	.15	
	Methyl Chloride	L	.05	.006
		V	.05	

IMPORTANT QUESTIONS IN SELECTING A DRIER

1. Does the material dry the refrigerant below the corrosion limits when placed in the liquid line? In the suction (vapor) line?
2. Does the material dry the refrigerant below the limits for ice formation with methyl chloride and the "Freon" refrigerants?
3. Does the material accomplish the drying in one passage of the refrigerant, or is it slow, i.e., requires several passages?
4. Does the material deteriorate in physical character in handling or when it removes water from the refrigerant?
5. Does the oil affect the drier adversely?
6. Does the drier corrode?

ANSUL REFRIGERANTS ARE AVAILABLE AT LEADING WHOLESALERS EVERYWHERE

ANSUL CHEMICAL COMPANY

REFRIGERATION DIVISION, MARINETTE, WISCONSIN

DISTRIBUTORS FOR KINETIC'S "FREON 11" "FREON 12" "FREON 21" "FREON 22" AND "FREON 113"



SEND FOR THIS BULLETIN

An informative reprint, "REFRIGERANT DRIERS," will be sent on request. No obligation. Send for it today.

ANSUL WHOLESALERS are ready and equipped to render an intelligent, co-operative service to refrigeration engineers and maintenance men on problems which arise from time-to-time in the operation of refrigerating systems.



*REG. U.S. PAT. OFF.

Good Compressor
Good Coils
Good Refrigerant

"DETROIT" VALVES



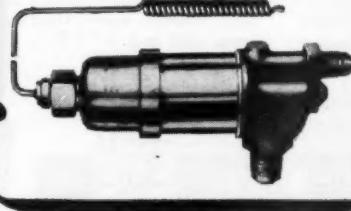
Particular refrigeration men everywhere prefer "Detroit," because they know that "Detroit" Expansion Valves and Solenoid Valves make refrigeration systems operate to best advantage. "Detroit" Gas Charging results in better and smoother operation with less load on the motor.

There is a "Detroit" valve for every application.

There is a "Detroit" valve for every application.

NO. 673 — "THE STANDARD OF THE REFRIGERATION INDUSTRY"

"Detroit" No. 673 has a long record of dependable performance in a wide variety of installations, and has been, for many years, "the standard of the refrigeration industry." Designed for average size commercial and air conditioning installations. Sensitive and accurate in operation—gas charged for instant response and reduction of motor load during pull-down cycle. Dura-flex bellows and Delubaloy needles and seats resist corrosion and assure long life.

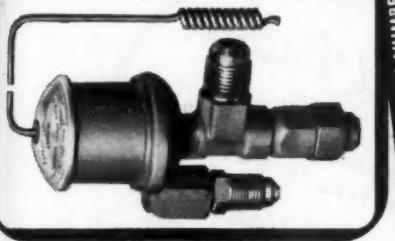


UNIT NUMBERS OF NO. 673 VALVE

Use "Detroit" Unit Numbers when ordering these stock items from your "Detroit" Wholesaler.			
Connections			
Unit No.	Refrigerant	Max. Pressure	Inlet: $\frac{3}{8}$ " SAE for $\frac{3}{8}$ " x $\frac{1}{4}$ " Reducing Nut. Outlet: $\frac{1}{2}$ " SAE
6731968	Freon-12	15	
6731428	Freon-12	55	
6731563	Methyl	10	
6731411	Methyl	40	
Rated at 1-ton Freon-12 or 2-ton Methyl.			

NO. 573 — THE SAME SUPERIOR PERFORMANCE AS THE NO. 673 FOR SMALLER INSTALLATIONS

This valve, in $\frac{1}{2}$ ton (Freon-12) capacity, has the quality and operating characteristics of No. 673. Designed for small commercial installations, its double diaphragm construction, with a gas charged power element, permits close superheat control at low suction pressures. Motor overload protection in its simplest, most effective form is provided by means of a single power element.



UNIT NUMBERS OF NO. 573 VALVE

Use "Detroit" Unit Numbers when ordering these stock items from your "Detroit" Wholesaler.			
Connections			
Unit No.	Refrigerant	Max. Pressure	Inlet: $\frac{3}{8}$ " SAE for $\frac{3}{8}$ " x $\frac{1}{4}$ " Reducing Nut. Outlet: $\frac{1}{2}$ " SAE for $\frac{1}{2}$ " x $\frac{1}{4}$ " Reducing Nut.
57300	Freon-12	4.5	Inlet: $\frac{3}{8}$ " SAE for $\frac{3}{8}$ " x $\frac{1}{4}$ " Reducing Nut. Outlet: $\frac{1}{2}$ " SAE for $\frac{1}{2}$ " x $\frac{1}{4}$ " Reducing Nut.
57309	Freon-12	10	
57311	Methyl	35	
57315	Methyl	5	
Rated at $\frac{1}{2}$ -ton Freon-12 or $\frac{1}{2}$ -ton Methyl.			

DETROIT LUBRICATOR COMPANY



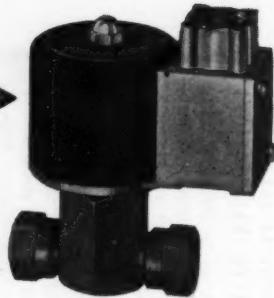
General Offices: 5800 TRUMBULL AVENUE, DETROIT 8, MICHIGAN
Divisions of AMERICAN REFRIGERATOR & STANDARD SANITARY CORPORATION
Canadian Representatives — RAILWAY AND ENGINEERING SPECIALTIES LIMITED, MONTREAL, TORONTO, WINNIPEG

"Detroit" Heating and Refrigeration Controls • Engine Safety Controls • Safety Float Valves and Oil Burner Accessories • "Detroit" Expansion Valves and Refrigeration Accessories • Stationary and locomotive lubricators

2 Tons Freon SV 21
Brass body, renewable soft Neoprene seat. Come-apart construction with rotatable coil and aluminum junction box. $\frac{3}{8}$ " F.P.T. connection.



SV 11 1 Ton Freon
Brass body, mounted in standard electrical outlet box. Easily installed. $\frac{3}{8}$ " F.P.T. connections.



INTERNAL
PARTS OF
HENRY SOLENOID VALVES
ARE MADE OF
STAINLESS
STEEL.

Henry Solenoid Valves

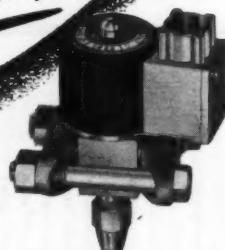
choice of
refrigeration engineers who
want quiet, efficient valves
...of advanced design!



**SV 31
and
SV 51**



**SV 101
and
SV 201**



SV 22

3 Tons and 5 Tons Freon
Brass body, come-apart construction with rotatable coil housing. Two piece impact plunger with direct acting metal-to-metal seat on SV 31. Neoprene seat on SV 51. Manual operating stem. $\frac{3}{8}$ " and $\frac{1}{2}$ " F.P.T. or solder connections.

10 Tons and 20 Tons Freon
Brass body with flanged come-apart construction. Pilot-piston operated. Connections $\frac{3}{4}$ " F.P.T. or $\frac{3}{8}$ " O.D. solder.

10 Tons Ammonia
Steel body with come-apart construction and hardened steel renewable seat. Aluminum junction box. Manual operating stem. $\frac{3}{8}$ " and $\frac{1}{2}$ " F.P.T. flanged connections.

SOLD BY LEADING JOBBERS

HENRY VALVE COMPANY

Control Devices, Valves, Drives, Strainers and Accessories for Refrigeration and Air Conditioning and Industrial Applications

3260 W. GRAND AVENUE • CHICAGO 51, ILLINOIS



Cable: Hervalco, Chicago 6

THOUGHTS FOR SERVICE ENGINEERS

**CUSTOMERS
DON'T WHISPER
SQUAWKS!**



A complaining customer has the effect of a rock thrown into a pond...the ripples spread, and spread, and spread. Good merchandising dictates the need for doing what you can to avoid the costly time and trouble it takes to make him a profitable customer again. A sound idea for protecting your reputation for service is the recommending and installing of dependable, long life condensing units. And when it comes to condensing units, no name is more highly regarded than "BRUNNER." One good customer is worth more to you than the cost of any condensing unit—so why settle for anything less than the best?

BRUNNER MANUFACTURING CO.
Utica 1, New York, U. S. A.

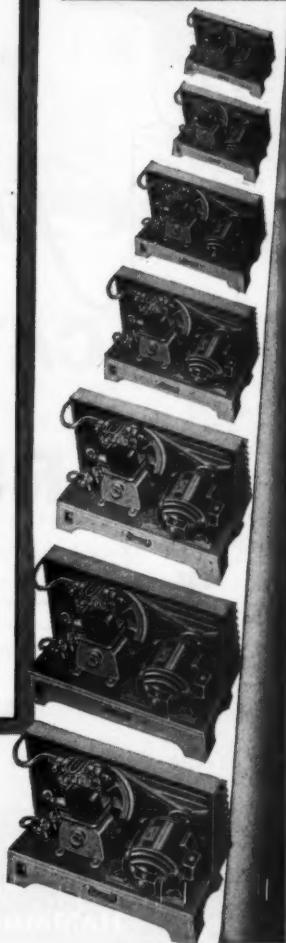
AIR AND WATER COOLED MODELS

1/4 HP. TO 25 HP.



REFRIGERATION

helps you serve better



Your
NEW
Filterpure
CATALOG
IS
READY

Get Your Copy from Your Wholesaler—or Write Us

BETZ CORPORATION
HAMMOND • INDIANA

FASTER AND EASIER FLARING BECAUSE IT'S

Self-Clamping



HERE ARE THE THREE
SIMPLE STEPS IN MAKING
A FLARE

1

Spread bar and insert
tubing in proper opening.

2

Close bar and slide
yoke over hinged end of
bar.

3

Center spreader cone
over tubing and turn
compressor screw down
firmly. The result—a per-
fect 45° flare.

IMPERIAL
NO. 295-FS
FLARING
TOOL

With the new Imperial Self-Clamping Flaring Tool you merely insert tubing, slide self-clamping yoke over the wedge-shaped bar and flare. What could be more simple?

No nuts, levers or other devices to be tightened . . . , the wedging action of the forged steel yoke takes care of all that by holding the tubing tightly in the bar for a quick flaring job. You cannot find a more convenient, speedier tool for making 45° flares for SAE flared joints than this Imperial Self-Clamping Tool.

No. 295-FS Imperial Self-Clamping Flaring Tool
for 1/4", 5/16", 3/8", 1/2", and 5/8" outside
diameter tubing. Price each \$5.20

See Your Jobber

THE IMPERIAL BRASS MFG. CO.
534 S. Racine Ave., Chicago 7, Ill.

IMPERIAL

Fittings • Valves • Driers • Filters • Floats • Charging Line
Tools for Cutting, Flaring, Bending, Coiling, Pinch-Off and Swedging.

DOUBLE-TUBE COUNTER-FLOW CLEANABLE WATER-COOLED CONDENSERS

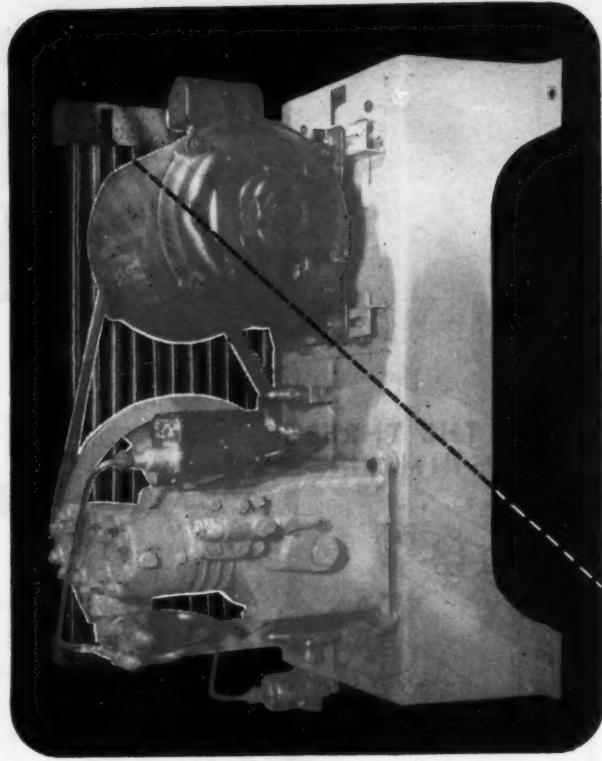


Photo shows 1 H.P. HM Condenser at work in a typical commercial refrigeration unit.

**HALSTEAD &
MITCHELL
CONDENSERS**

Greatly
**Increase the
efficiency of
any refrigeration
System!**

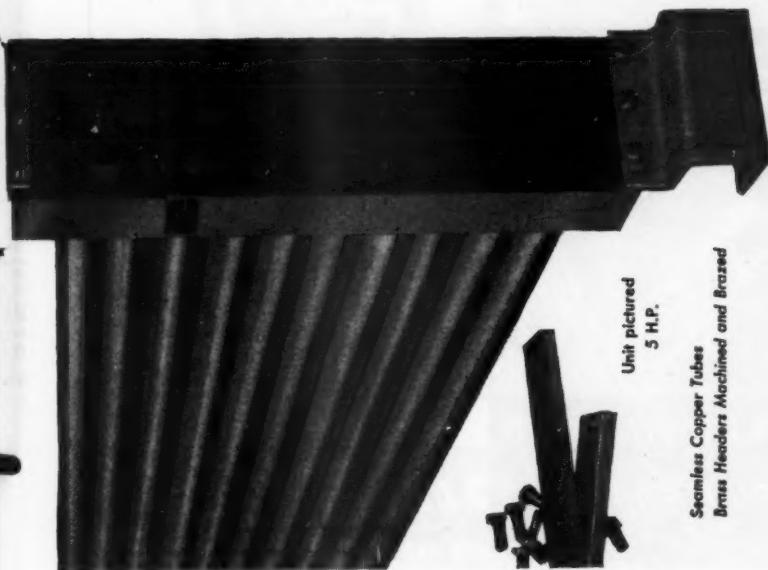
System!

Photo shows H.M. Condenser at work in a typical commercial plant.

As the age of most water-cooled condensers increases and corrosive material builds up within the water tubes, more and more electrical energy is required and less and less refrigeration is received. Your operation costs, in the form of increasing water and electric bills, will rise because your unit must stay in operation longer to provide the amount of refrigeration needed.

Not so in an HM Cleanable Condenser where the proper heat-exchange efficiencies are continuously maintained for the life of the Condenser. HALSTEAD & MITCHELL Condensers are constructed to outlive and outwear the motor and the compressor of most refrigeration units.

HM Cleanable Condensers can be maintained at "new-unit" efficiency and economy by regular and continued use of a standard cleaning tool. Water tubes are easily accessible at both ends (as shown) for the spiral tool to clean and restore copper water surfaces to their original heat-exchange efficiencies—the result is longer life and operational economy for your refrigeration units.



Unit pictured
5 H.P.
Stainless Copper Tubes
Brass Headers Machined and Brazed



Wholesalers in principal cities Write for descriptive literature.

OFFICES: Bessemer Building, Pittsburgh 22, Pa.

A COMPREHENSIVE LINE

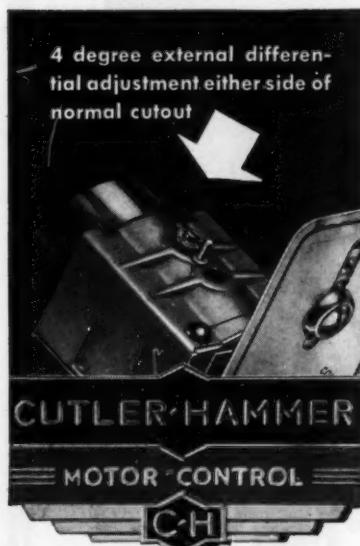
Cutler-Hammer Refrigeration Replacement Control

The Cutler-Hammer line of Refrigeration Replacement Control is unusually comprehensive and complete. One unit alone, the *Universal* unit, will handle 60% of the repairman's needs. In rare cases where exact replacement control must be furnished, that item also will be found in the Cutler-Hammer line, individually packed, clearly labelled, complete with dial plate, mounting screws, trim washers and instructions for mounting, and range and differential adjustments.

The Cutler-Hammer Line of Refrigeration Replacement Controls is the product of more than 50 years of fundamental control specialization . . . another reason why outstanding refrigeration wholesalers recommend it and alert service organizations from coast to coast feature and use it. . . .



CUTLER-HAMMER, Inc., 1363
St. Paul Ave., Milwaukee 1, Wis.



DOMESTIC, SEMI-COMMERCIAL AND COMMERCIAL CONTROL

**This One Universal
unit alone covers
60% of all needs.**

◀ Bul. 9521N9

Adjustable Mounting Brackets

Maximum Mounting Centers . . . 4-3/16
Minimum Mounting Centers . . . 2-3/16

Adjustable Cutout Feature—Differential can be increased 4 degrees by turning indicator in "Hi" direction and decreased 4 degrees by turning in "Lo" direction.

Adjustable Range—Turning screw clockwise lowers settings and counter-clockwise raises settings.

Operating knob can be adjusted to meet various evaporator scale settings. New knob is ideal for varying shield thicknesses. Makes this control adaptable to wider range of single dial replacement jobs where overload is not required in unit.



LAST YEAR'S
IMPROVEMENT
*
THIS YEAR'S
STANDARD

The THERMO-LIMIT has now proved its worth in tens of thousands of refrigeration systems. It combines all the advantages of liquid- and gas-charged valves:

- PRESSURE LIMITING. Prevents motor overload.
- INTERCHANGEABLE PRESSURE LIMIT. Various pressure "cartridges" can be easily replaced in the field.
- LIQUID-CHARGED. Positive control — can be installed in ANY location or position.
- INTERCHANGEABLE CAPACITY. Various cage assemblies can be easily exchanged in the field.
- EXTERNAL ADJUSTMENT. Change of super-heat does not affect pressure limiting point.

Available at Alco wholesalers everywhere. Write for our Bulletin 152.



Designers and Manufacturers
of Thermostatic Expansion
Valves; Pressure Regulating
Valves; Solenoid Valves;
Float Valves; Float Switches.

ALCO VALVE CO.

857 KINGSLAND AVE. • ST. LOUIS 5, MO.



**ENGINEERED
to fit..**

**FORGED FLARE NUTS
AND FITTINGS**

Prompt Shipment on most items



Electrimatic

2100 INDIANA AVE CHICAGO 16 ILLINOIS

REMOTES SCALE

QUICKLY... EASILY... THOROUGHLY... ECONOMICALLY...

Condenser Coils
Unit Coolers
Spray Heads
Refrigeration Drains
Valve Plates
Control Valves
Stuck Compressors
Evaporator Fins
Water Coolers
Temperature Thermostats

CLEAN coils, pipes, and drains with NU-COIL—keep them clear as a whistle... functioning like new! NU-COIL removes insulating deposits that increase head pressure and cause loss of operating efficiency. Scaled cooling tubes cleaned with NU-COIL perform with renewed operating efficiency... reduced operating costs.

NU-COIL is sufficiently mild for use on expensive light metals and precision fittings. NU-COIL is easy to handle... Requires no special handling equipment.

Available everywhere at the better Refrigeration Wholesale Supply Houses. Write today for FREE descriptive folder.



SKASOL CORPORATION
113 GLENCOE AVENUE • WEBSTER GROVES 19, MISSOURI

"One Shot and Sure Shot" ... SAYS MR. SPEAR

THAWZONE
PATENTED
The PIONEER FLUID DEHYDRANT

PHONE 4848

HARRY H. SPEAR
REFRIGERATION SERVICE ENGINEER

November 28, 1946

Highside Chemicals Company
195 Verona Avenue
Newark 4, New Jersey

Attention: Mr. L. V. Gardner

Dear Mr. Gardner:

I started using Thawzone exclusively six years ago and since then have never used a dryer (except on SO₂) in any service or installation work. I always install a new strainer, put in Thawzone, and then go away and forget it. Thawzone is a one-shot and then go away and position with us. When you service and sure-shot positive in action.

Some time ago I installed an F12 locker plant (20 H.P.) and used some old 1-1/4" iron pipe coils. These were cleaned and washed in carbon tet, and then, to be on the safe side, I put two quarts of Thawzone into the 500# of Freon. This job has given us no trouble at all from freeze-ups. We also added 1-1/2 quarts of TRACE at the same time.

Every new job has Thawzone applied directly into the receiver and strainer, as I have yet to see any such equipment in which every piece is absolutely dry. On service jobs we inject Thawzone into both the strainer and crankcase. I have never had any adverse conditions arise in any system from the use of Thawzone. We cannot praise Thawzone enough and you may call on us for a reference any time.

Sincerely,

Harry Spear

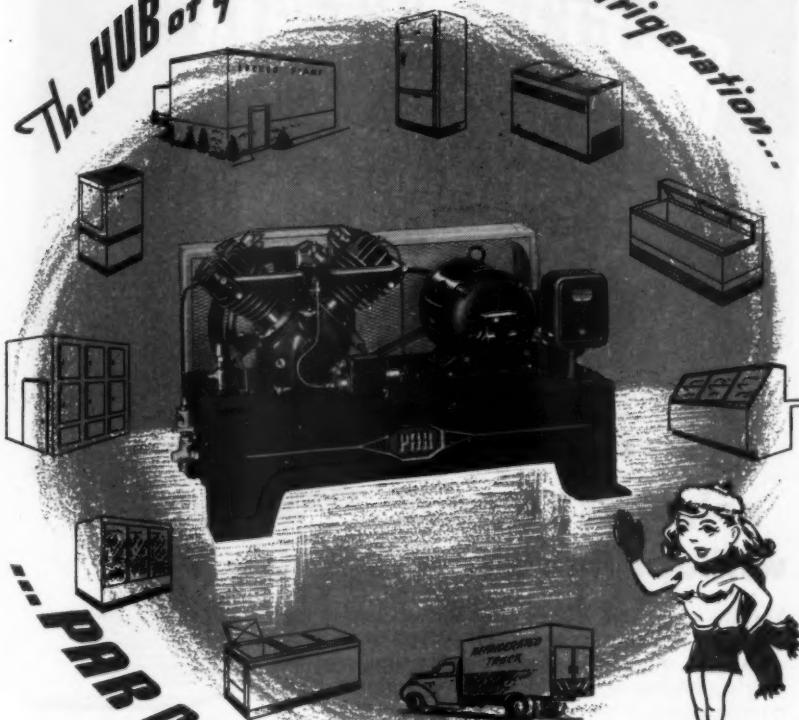
HHS:A

HIGHSIDE CHEMICALS CO.

195 VERONA AVE.

NEWARK 4, N. J.

The HUB of good, dependable refrigeration...



...Par Condensing Units models and sizes
from $\frac{1}{6}$ to 5 hp. See your

Par wholesaler or write
for Par catalog R-98.

... By Comparison — You'll Buy PAR
Lynch Manufacturing Corporation
General Offices, Toledo 1 • Factory, Defiance, Ohio, U.S.A.



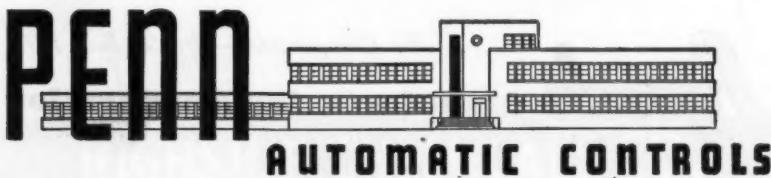
Controls polyphase motors without line starters

Yes, it's true! This PENN 270 Series Control requires no line starters to control polyphase motors of 3 H.P. and under (where protection against single phasing is provided). Shown above is a typical 3-wire, 3-phase hookup.

In addition, this new and different switch can control two separate load circuits. And when wired in single phase circuits as a 2-pole switch it always breaks the "hot" line.

Be sure to get full details of this new 270 series. **Penn Electric Switch Co., Goshen, Indiana. In Canada: Penn Controls, Ltd., Toronto, Ontario. Export Division: 13 E. 40th St., New York 16, U. S. A.**

Series 270 and 272 PENN "Single" Temperature or low side pressure controls. Also (not shown) Series 271 and 273 PENN "Dual" Controls which combine in one unit a temperature or low side pressure actuated mechanism and built-in high pressure safety cut-out.



FOR HEATING, REFRIGERATION, AIR CONDITIONING, ENGINES, PUMPS AND AIR COMPRESSORS

Need Gas?

"FILL IT AND FORGET IT"



WITH

Virginia "V-Meth-L"

Recharging with Virginia Methyl Chloride is a painless way to get rid of your refrigeration troubles. "V-Meth-L" is made specifically for refrigeration purposes . . . is consistently pure. The contents of each cylinder is tested and re-tested to maintain the high quality that has made "V-Meth-L" world-renowned. Remember, the use of a good refrigerant is the first step in preventing kick-backs due to sludging, copper plating, or frozen expansion valves. VIRGINIA SMELTING COMPANY, West Norfolk, Va.
Established 1898.

Distributors for Kinetic's "Freon" Refrigerants

VIRGINIA
Refrigerants

WEST NORFOLK • NEW YORK • BOSTON • DETROIT

SERVICE ENGINEER

17

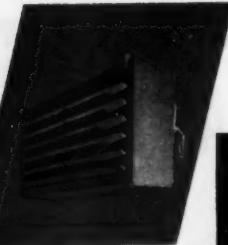
July, 1947

"V-METH-L"

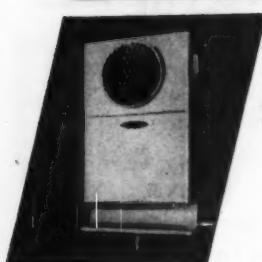
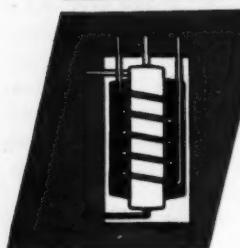
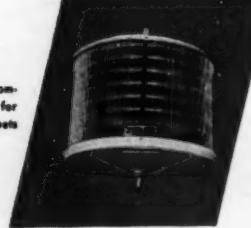
Buy from
Your
Wholesaler



The Cool Master
An efficient, cooling unit for walk-in refrigerators and other space cooling.



The Curvette
A new cooling unit of compact, distinctive design, for reach-in refrigerators, cabinets and counters.



Thermobank Automatic Defrosting
The only completely automatic low temperature defrosting system requiring no attention, no water sprays, no brine sprays and no electric heaters.

The Panel Unit Cooler
A highly efficient, compact, convection cooling unit for reach-in refrigerators — made in a complete line of sizes and capacities.

count upon

KRAMER

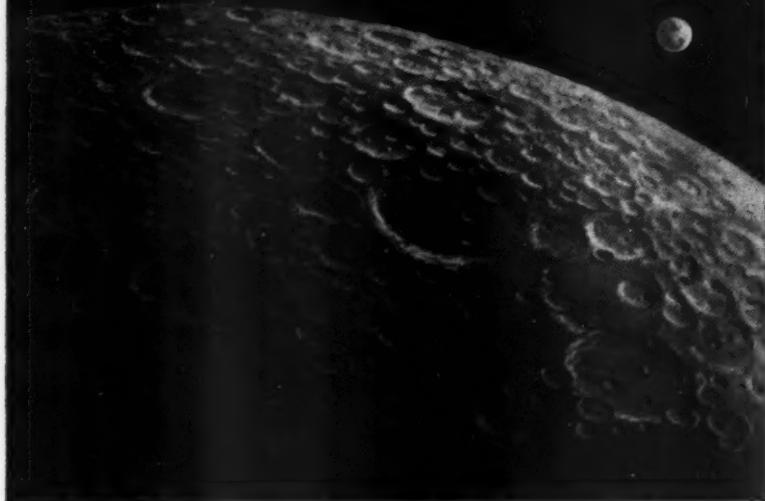
*for ADVANCED
ENGINEERING*

Our business is that of manufacturing heat exchange equipment for the refrigeration industry. Our aim is to contribute to the advancement of the art. It is with some satisfaction that we review our latest achievements, including: the creation of a complete line of forced convection cooling units; the development of low temperature de-frosting equipment culminating in the invention of the Thermobank; and the maintenance of accurate capacity ratings for all equipment. RS

**"IT'S THE COILS
THAT COUNT"**

**KRAMER TRENTON CO.
TRENTON 5, NEW JERSEY**

ABSOLUTE ZERO



If you were to step from the sun-lit surface of the Moon into a crater shadow, you would be plunged into inky darkness and inconceivable cold. Here the temperature hovers near the "absolute zero" of outer space, the utter absence of heat.

Man cannot artificially achieve this abysmal cold . . . would have little practical use for it if he could. However, in his numerous and daily uses for refrigerated spaces, varying degrees of cold must be economically produced and maintained. Ease of access and effective seal are assured, when the installation includes appropriate Jamison-built doors.

For nearly half a century, the Jamison name-plate on a cold storage door has stood for expert design and precise, painstaking workmanship . . . uniformly dependable operation over a long life of rigorous use.

Today's outstanding Jamison line . . . Jamison, Stevenson, Victor, and NoEqual Doors, and related products . . . serves the diverse needs of the refrigeration, cold storage, and frozen food industries. For full information concerning the complete Jamison line and the address of your nearest branch, write Jamison Cold Storage Door Company, Hagerstown, Maryland.

*Branches
in Principal Cities,
Coast to Coast*





**DFN takes 3 big steps
to bring you**

100% DRYING EFFICIENCY!



1. NEW SIZING METHOD

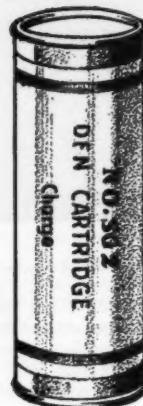
Special operation assures accurate size and smooth walls of cartridge, assuring perfect fit in shell, facilitating installation and removal.

2. IMPROVED BAKING METHODS

Each DFN Cartridge is baked at 300° F. in controlled-temperature ovens, for 3-4 hours.

3. NEW PACKING METHOD

DFN Cartridges are immediately hermetically sealed in a new, specially-designed, moisture-proof, metal end container. 100% drying efficiency is maintained until used. Easily identified, informative labels.



• These DFN advancements are part of our continuing program to put dehydration on a scientific basis. They are made at no extra cost to you. Ask your jobber for DFN Dehydrators. Write for Catalog R-7.

MINTIRE CONNECTOR CO., 255 JEFFERSON ST., NEWARK 5, N. J.



DEHYDRATORS • STRAINERS



FILTERS • NEUTRALIZERS



NOW — "Freon" Moisture Content Less Than 10 Parts Per Million

*Sensational dryness of
"Freon" Refrigerants provides
greater protection for
low-temperature refrigerators*

To meet the need for proper frozen food storage in lockers and household refrigerators, "Freon" safe refrigerants are now produced virtually anhydrous . . . practically eliminating the possibility of freezing in evaporators and expansion valves!

After extensive research, Kinetic chemists, physicists, and engineers designed and installed new equipment in the "Freon" plant . . . equipment that now produces "Freon" with a moisture content of less than 10 parts per million!

This means that there are less than two teaspoonsfuls of water in a ton drum of "Freon" . . . half a gram in a 145-lb. cylinder!

This sensational dryness, in addition to the purity and quality of every ounce of "Freon," has made possible and practical new and better low-temperature equipment for freezing and storing quick frozen foods. It is another reason why these safe refrigerants are ideal for all types of commercial, industrial and household applications. Kinetic Chemicals, Inc., Tenth and Market Streets, Wilmington 98, Del.

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2. EVERY DETAIL, FROM FLYWHEEL TO VALVE PLATE, IS DESIGNED WITH EASY SERVICING IN MIND.

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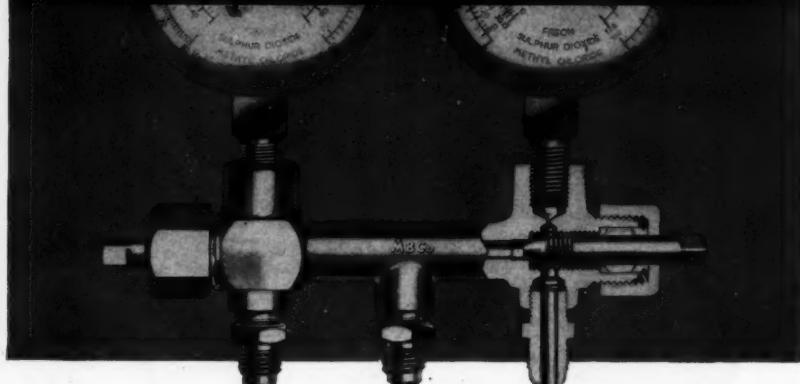
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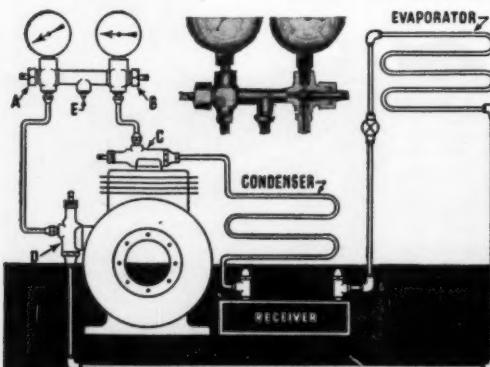
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DIRECTIONS FOR USE

1. To Observe Operating Pressures

Valve A—Closed Valve B—Closed
Valve C—Back Seat Cracked Open
Valve D—Back Seat Cracked Open

2. To Charge Refrigerant Through Compressor

Connect Refrigerant Drum to E
Valve A—Open Valve B—Closed
Valve C—Back Seat Cracked Open
Valve D—Closed—Front Seated

3. To Purge Receiver

Connect Purge Line to E
Valve A—Closed Valve B—Open
Valve C—Back Seat Cracked Open

4. To Charge Liquid Into High Side

Connect Refrigerant Drum to E
Valve A—Closed Valve B—Open
Valve C—Mid Position

5. To Build Up Pressure in Low Side for Control Setting or to Test for Leaks

Seal E with Seal Cap
Valve A—Open Valve B—Open
Valve C—Back Seat Cracked Open
Valve D—Mid Position

6. To Charge Oil Through Compressor

Connect Oil Supply to E
Valve A—Open Valve B—Closed
Valve C—Open—Back Seated
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New Method for the Return and Credit of Empty "Freon" Cylinders

Effective June 1, 1947, Kinetic Chemicals, Inc., issues credit or allows refund of original deposits on "Freon" cylinders to the party returning empty cylinders in accordance with the following stipulations:

1. Cylinders returned for credit or refund must carry identification "K C INC" stamped in steel shoulder of cylinder.
2. Empty cylinders are to be shipped to Kinetic Chemicals, Inc., Carney's Point, New Jersey, by rail freight, specifying P.R.S.L. as the delivering carrier; charges collect.
3. Copy of bill of lading classifying shipment as "Empty compressed gas cylinders old other than coppered or nickelized," and notification in form of debit memorandum or letter listing numbers of cylinders by sizes and serial numbers, which appear indented in steel immediately below specification "ICC-4B 300," must be forwarded to arrive in advance of receipt of shipment by Kinetic.
4. Credit or refund covering original deposit will be forwarded to the party returning cylinders upon

receipt and inspection of empty "Freon" cylinders returned in undamaged and usable condition. Deductions will necessarily be made for missing parts of cylinders.

5. Each cylinder returned should contain shipping tag showing consignee as Kinetic Chemicals, Inc., and the name and address of consignor. Tags will be furnished by Kinetic on request.

6. Kinetic reserves the right to reject cylinders which have not been returned within 180 days from date of original shipment by Kinetic.

It is believed that this new method of handling will simplify accounting procedures, eliminate multiple handling of refunds or credits, and will expedite receipt of refund or credit by the party returning empty "Freon" cylinders to Kinetic. Detailed instructions for the return of empty "Freon" cylinders, and credit or refund on these, may be obtained from your regular supplier or Kinetic Chemicals, Inc., Tenth and Market Sts., Wilmington 98, Delaware.





WITH the steady increase of air conditioning and commercial refrigerating equipment in the larger tonnage class, and the consequent additional strain on water supply and sewerage disposal equipment, it becomes more and more necessary to conserve water. The cost of water, and in some areas the actual scarcity, makes the use of evaporative cooling methods mandatory. Beginning in this issue on page 31 under the heading "The Evaporative Condenser" is a discussion by Paul B. Reed on the various methods of evaporative cooling and their application. It is good information to have in your file.

GENERAL MOTORS' "Train of Tomorrow" is at the present time on a tour of the country and will be on display in a number of cities. When it comes to your locality, you will find it a very interesting study in the application of mobile refrigeration and air conditioning. In the meantime, read the description of its equipment on page 36 of this issue.

AFTER completing his discussion on estimating an installation job in the June issue, Donald F. Daly offers this month, on page 38, some very useful general observations on the practices and work of the refrigeration contractor. The article is not complete in this issue but will be continued in August.

IT is quite probable that few men in the field of service realize that temperature affects the amount of light you get from fluorescent lamps and when selecting lamps for the walk-in cooler, locker room and other cold storages, no specifications have been made other than the length and wattage to fit the fixture. The efficiency of the lamp is

improved by proper selection and by proper shielding from cold drafts, as pointed out by J. C. Forbes on page 41.

AIR conditioning calculations can become quite lengthy and complicated at times, and so Edward Dowis in his article "Simplified Calculation of Air Conditioning Loads" has endeavored to condense the calculations into a more brief and simplified method. He uses an example estimate on a restaurant to illustrate his method. See page 44.

IF FLYING your own plane is one of your hobbies, it can be made to pay its way by using it as a business getter. This is demonstrated by the use one wholesaler is making of his plane. Read Harold Peer's article on page 49.

IF DRYERS heat up when first installed, does it mean there is moisture in the system and the moisture is being adsorbed? The answer to this one is contained in the Questions and Answers department beginning on page 51.

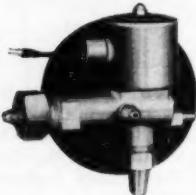
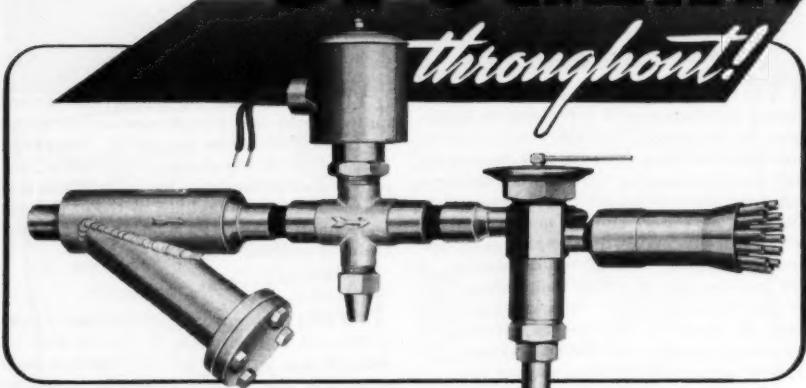
WHEN is it not possible to convert a capillary tube system to a high side float system, might be the question answered in one of the Service Pointers of this issue. It is contained on page 54.

COVER

THE front cover of this issue shows a new Tyler frozen food case flown from factory in Waxahachie, Texas, to Chicago airport for delivery to the customer by McCarty Bros. Equipment Corp., River Forest, Ill. Less than 24 hours elapsed from factory to customer (2000 miles) before the unit was ringing up sales in the cash register. It is believed that this is the first time equipment of this type has ever been shipped for delivery by air freight.

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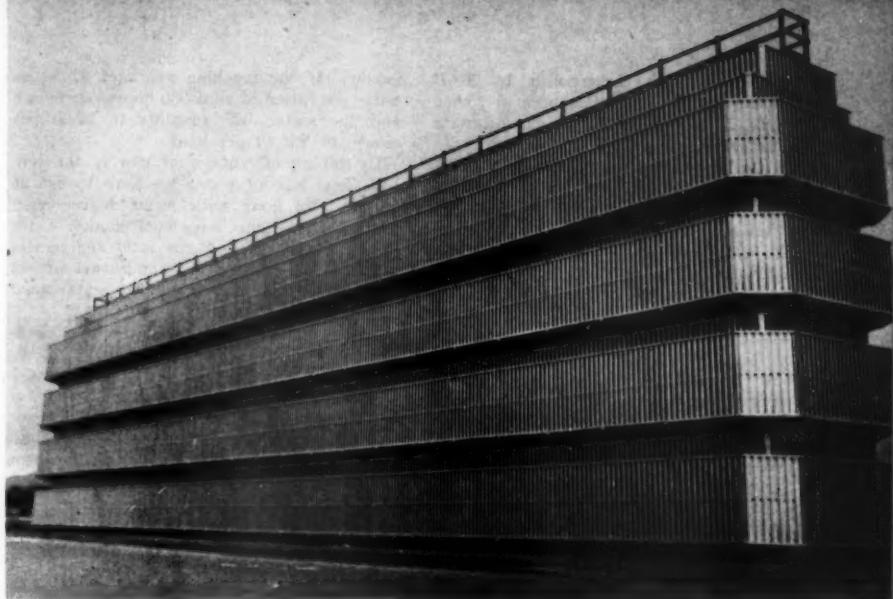


Fig. 3—A modern cooling tower installed for Growers Ice and Development Co., in Los Angeles.

The Evaporative Condenser

By P. B. REED*

IN ORDER to properly understand how an evaporative condenser works and in what way it is different from other types of condensers, it is necessary to go back to basic principles, but first let us see for a moment just what a condenser, regardless of what type it is, has to do.

When the liquid refrigerant evaporates in the evaporator it absorbs heat and turns into a vapor or "gas" as we usually call it. In a one ton installation, the amount of heat the refrigerant gets from the evaporator in one hour is 12,000 btu., for 12,000 btu. is the amount of heat absorbed per hour by a ton of ice (2,000 pounds) melting over a period of 24 hours.

This gas then leaves the evaporator and goes over to the compressor still carrying the 12,000 btu. per hour. By the time it gets to the compressor it has warmed up some in passing through the suction line, so that by

the time it gets to the compressor it is perhaps carrying 13,000 btu. per hour instead of 12,000.

It goes into the compressor and is compressed. In order to compress it the motor has to do work on the gas and this work turns into more heat that goes into the gas. This heat is called the "heat of compression" and is usually about one-fourth of the original heat coming from the evaporator, or per ton about 3,000 btu.

Thus, by the time the gas gets out of the compressor it has about 16,000 btu. in it, and since it has been reduced in volume, it has become quite hot. How hot, depends upon what refrigerant is used, the suction pressure and the discharge pressure. In the case of Freon 12 on an ordinary food storage installation the gas will come from the compressor at about 150 F, which is rather hot, as you who have touched your bare arm to the hot gas discharge pipe, know.

If the condenser is keeping the discharge pressure down to about 100 pounds per

* Chairman, R.S.E.S. International Educational and Examining Board. Talk given at 2nd Annual Wisconsin Association Convention.

square inch, which corresponds to 90 F saturation or condensing temperature, then we must first cool the 150 F gas down to 90 F before it even starts to condense. In other words, we must first remove the superheat which is the sensible heat of the gas from 150 F down to 90 F. This will be about 1500 btu. out of the 16,000 leaving about 14,500 btu. per hour to be removed to get the 90 F gas to change into a liquid at 90 F; that is, to remove the latent heat of condensation.

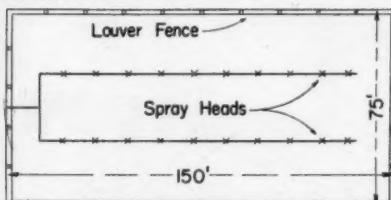


Fig 1—The spray pond.

Thus, each hour we have hot gas at 150 F to cool down to 90 F and then condense to a liquid at 90 F, and this must be done at a rate of 16,000 btu. to be removed each hour.

Let us see how much water would have to be used in order to remove this 16,000 btu. per hour, using an ordinary water cooled condenser.

The definition of a btu. is that it is the quantity or amount of heat required to raise the temperature of one pound of water one degree. If we raise 16,000 pounds of water one degree we could absorb those 16,000 btu. that we are trying to get rid of. If we bring in 16,000 pounds of water per hour and let the hot gas at 150 F be cooled down to 90 F and turned into a liquid still at 90 F, the water will be raised one degree in temperature and in so doing will carry away the 16,000 btu. per hour.

But 16,000 pounds of water is 1,920 gallons of water, for one gallon of water weighs about $8\frac{1}{2}$ pounds, and 1,920 gallons of water would cost about $38\frac{1}{2}$ cents at a rate of 20c per 1,000 gallons. So it would cost, for water alone, about $38\frac{1}{2}$ c per hour to operate our $1\frac{1}{2}$ hp. machine, which is, of course, far too much.

Instead of warming the water up only one degree going through the condenser, suppose that we warm it 20 F; then we need to use only $1/20$ as much water or 96 gallons per hour at a cost of about 2c per hour which is more like it.

But even then the 2c per hour runs into

money. If the machine averages 12 hours a day operation, it runs 360 hours per month and the water bill amounts to \$7.20 per month or \$86.40 per year.

By taking advantage of merely the sensible heat rise of water we have to use 96 gallons per hour with a 20 degree rise. Moreover, we must have cool enough water to start with to allow for a 20 degree rise and still have an outlet temperature of not more than 90 F; that is, the tap water must be not higher than 70 F.

In many parts of the country the available tap water is as high as 95 F in the summer, causing a high discharge pressure with a severe reduction in the capacity of the condensing unit just at a time when air temperatures are also high and every btu. that can be squeezed out of the equipment is needed.

Moreover, in many localities, some of them being the same ones where water temperatures are high, the cost of water is high also and represents an important factor in the cost, not only of operating the refrigerating equipment, but also in the total cost of operating the business.

Spray Ponds

For many years it has been the practice with the large tonnage machines used in ice-making, cold-storage house and breweries to cool the warm water from the condensers and use it over again. Considering that thousands of gallons per day or even per hour are required for these large installations, the cost of water, if thrown away after coming from the condenser, would be enormous. To cool this warm water so that it could be used over again, the water is pumped from the condenser out to a large pond called a spray pond as shown in Fig. 1. There it is sprayed out into the air and then it falls back into the pond. Some of the spray water evaporates into the air so that by the time it falls into the pond it is quite cool.

Let us inquire a bit into just why this method cools the water. It certainly is not cooled by contact with cool air for the air may be hotter than the water. In the summer the air may be 100 F for example and the water from the condenser is only 90 F. We may find that the water is cooled down to perhaps 70 F or 75 F by the 100 F air. How is this?

Let's digress for a moment to our refrigeration evaporator. We "spray" liquid refrigerant into it and it vaporizes into a gas

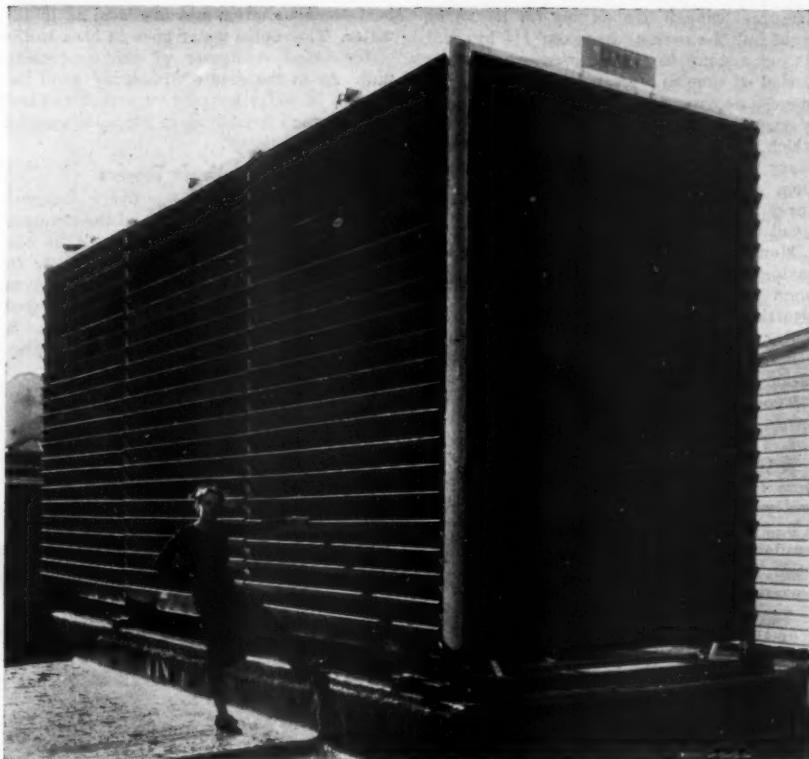


Fig. 2—A typical 300 Gpm. atmospheric cooling tower.

and takes up a tremendous amount of heat in doing so. This heat that the refrigerant takes up in vaporizing is called the latent heat of vaporization and it represents the heat energy necessary to turn the liquid refrigerant into refrigerant vapor.

Something about like that happens when the water is sprayed into the spray pond. It vaporizes and takes up its latent heat of vaporization in turning from a liquid, water, to a vapor; that is, it also takes up its latent heat of vaporization.

The latent heat of vaporization of water is very high. Under ordinary spray-pond conditions it runs about 1,000 btu. per pound. Every pound of water that is vaporized 1,000 btu. are taken from the water, so, referring back to our little 1½ hp. unit that put 16,000 btu. per hour of heat into the water, we would only have to vaporize about 16 pounds or two gallons of water to

cool the 96 gallons of water down from 90 F to 70 F. Two gallons would be lost, vaporized and carried away into the air, so two more gallons would have to be added each hour but this is very small compared to the 96 gallons per hour that is used if it is simply passed through the condenser and then wasted. So we save 94 out of 96 gallons, a saving of over 95 per cent.

Actually we do not save quite this much, for the wind carries away more than the two gallons although only two gallons may be all that are really vaporized. In practice, somewhere between five and ten per cent of the water is vaporized and lost, so the savings in water are from 90 to 95 per cent, still a very fine and worthwhile saving.

But it costs a considerable amount of money to build a spray pond including the sprays, piping and pumps for circulating the water. For big installations the savings

are great enough to soon pay for the spray pond but the savings from our 1½ hp. unit do not amount to enough even over quite a period of time to warrant the outlay of the money necessary to build a spray pond. Moreover, our small unit is fully automatic, which doesn't particularly lend itself to a spray pond, which requires occasional attention. Perhaps too there isn't room for a spray pond, even a small enough one for our small unit.

Moreover, we have been considering the savings in water costs only. With the spray pond we must also consider the cost of the electricity to run the circulating pump motor and the increased maintenance cost in keeping the spray nozzles open, the pond clean, etc.

The main points then, in favor of the spray pond, are:

1. Tremendous savings in water cost.
2. Cooler water to the water-cooled condenser in many areas where the available water is quite warm in the summer.
3. Purity of the water. In some areas the available water contains a great deal of sediment, minerals, alkalis or acids that foul or corrode the condenser.

Against these advantages are:

1. High cost of initial investment.
2. Increased space required.
3. Increased maintenance and repair costs.
4. Unsuitability for non-automatic systems unattended by operating personnel.
5. Difficulties in freezing weather.

From these objectionable features it is apparent that the spray pond was not suitable for the small, automatic, unattended installations.

Cooling Towers

Another means of cooling the water from the water-cooled condenser so that it can be recirculated through the condenser is the cooling tower. It works in very much the same manner as the spray pond, except that the floor space required is much less. A common form is illustrated in Fig. 2. A fence of slanting boards is built around the sprays to reduce the amount of water lost by windage. In other forms, as in Fig. 3, the water is allowed to run down over slanting boards, wire nets or any other methods to break up the water and expose it to the air. The air may move by natural convection or a fan may be used. In any method, the purpose is to get some of the water to evaporate into the air and in so doing absorb the latent

heat of vaporization and thus cool all of the water. The cooled water goes on back to the water-cooled condenser of the condensing unit. As in the case of the spray pond the amount of water actually vaporized and lost is very small compared to the total amount of water circulated.

Forced Draft Towers

Another form of water tower deserves special notice for it has some of the elements of the evaporative condenser. It is the forced draft tower illustrated in Fig. 4. In this type the warm water is pumped from the water-cooled condenser and sprayed downward from a series of spray nozzles in a spray tree. As in the case of the spray



Fig. 4—A typical type of forced draft tower.

pond, the evaporation of a very small portion (less than 5%) of the water cools the entire water circulated, which falls down into an open vessel, sometimes called a sump tank. From this sump tank the cooled water flows back to the water-cooled condenser of the condensing unit. Also, as in the case of the spray pond, some of the water entrained in the air, in addition to that evaporated, is blown away and lost. To make up for the water evaporated and the entrained water, both of which are lost to the

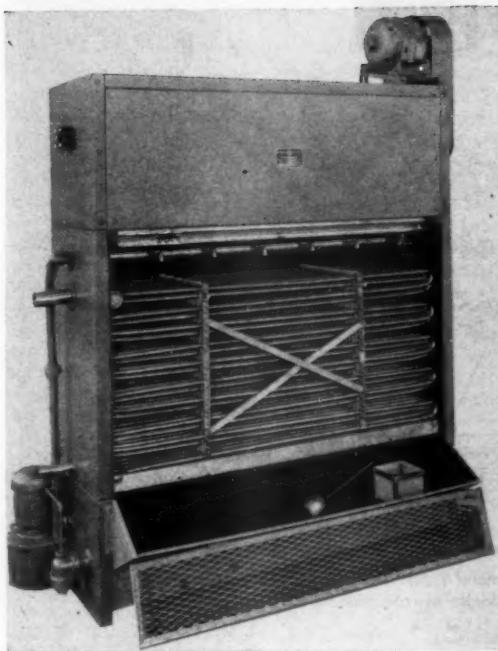


Fig. 5. An internal view of the evaporative condenser.

system, fresh water is added to the sump tank. A float valve similar to that in a toilet seat (also similar to a refrigeration low side float) maintains a minimum water level in the sump tank.

An exhaust fan is placed above the sprays and an upward current of air is induced through the water spray. To remove entrained or "drift" water carried by the air, an eliminator is provided that consists of a set of zigzag baffles forming a maze on which the globules of water impinge and are separated, to fall back into the sprays or drain off to the sump, in much the same manner as oil is removed from hot discharge refrigerant gas in a high-side oil separator.

All of this equipment is mounted compactly on one base and enclosed in a sheet metal housing. It is known as an induced draft tower or as a forced draft tower.

It will be noted that the purpose of the spray pond or of the cooling tower is to remove the heat from the water coming from the condenser by evaporating a small part of it. It should also be noted that the condenser is separate from the pond or tower

and that the warm water from the condenser is circulated from the condenser to the pond or tower and after it is cooled, back to the condenser with what make-up water is required to compensate for that evaporated and lost by wind-draft.

If we take the forced draft tower shown in Fig. 4 and put a coil under the spray and use this finned coil as a condenser, we have what is known as an evaporative condenser as illustrated in Fig. 5. What we have done is to bring the hot gas to the tower and condense it there into a liquid refrigerant ready to use, instead of pumping the warm water from the water-cooled condenser to the tower, cooling it and taking it back to the condenser.

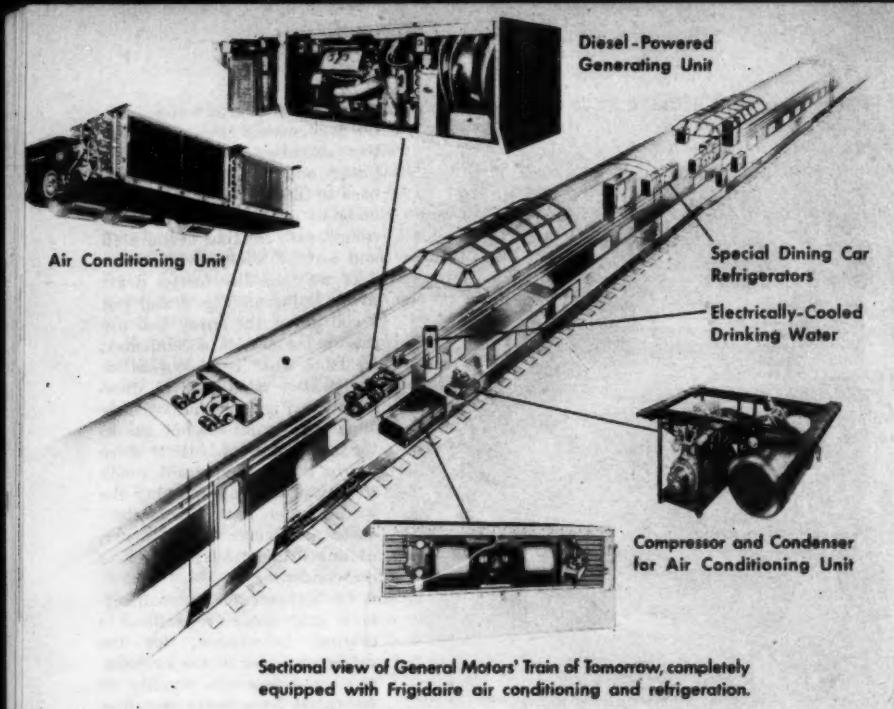
The advantage is in compactness and some reduction in original investment, for the refrigerant coil in the evaporative condenser can usually be furnished for a lower cost than a water-cooled condenser of equal capacity.

The water pump is still necessary, for the water from the sump must still be pumped back up to the spray tree, so an electrically driven water pump is usually mounted on the common base. It takes its inlet from the sump tank and its discharge goes to the spray nozzles. The friction head of this short water circuit is less than over to and through a separate water-cooled condenser, so the pumping costs are reduced.

Moreover, the pump need not have as great a capacity for an evaporative condenser as for a spray pond or cooling tower, for with them the water-cooled condenser still requires a large amount of water since it depends upon the sensible heat absorbing ability of the water on one btu. per pound ($8\frac{1}{2}$ btu. per gallon) per degree it is warmed.

(To be continued)

ALL in all, the refrigeration industry expects to manufacture in 1947 more than 500,000 units of low temperature equipment going directly into use in the frozen foods industry, not including home freezers.



General Motors "Train of Tomorrow" Promotes Increased Use of Refrigeration

BEHIND the scenes in General Motors' sleek, revolutionary new "Train of Tomorrow," engineers have developed and installed new air conditioning and refrigeration equipment which promises to increase passenger-comfort standards to unprecedented new heights. Each of the four

astradome car has been outfitted with these developments and the traveler on this new train is as comfortable, well-fed, and entertained as he is accustomed to be in a fine hotel.

Frigidaire engineers examined the limitations of existing railway car electrical systems, surveyed probable future requirements, and then designed an entirely new type of generating unit to meet their requirements. This compact "power-package," pictured lower left on this page, developed with the cooperation of Detroit Diesel Engine and Delco Products Division of General Motors, provides each car with its own individual source of electricity for air conditioning, ventilation and refrigeration, plus fluorescent lighting of highest quality.

The dining car, featuring an all-electric kitchen, is equipped with a 40 KW auxiliary power package which is operated only when additional current is required for the kitchen appliances.



Air Conditioning

Of the many services contributing to the pleasure of modern railroad travel, none is more important than air conditioning. Comfortable, healthful conditions must be provided for the passenger—regardless of prevailing weather conditions outside. Clean, purified air at the correct temperature and humidity, free of drafts, is supplied throughout the car. This system functions automatically, "modulating" its operation for continuous passenger comfort.

An air conditioning system of 10 tons cooling capacity is installed in each car. Six tons of cooling are applied to the lower compartments of the car and four additional tons are directed to the astra-dome compartment. Ducts carry conditioned air to the various parts of the car where it is discharged without drafts. The design of this duct system varies with different types of cars. A control system provides automatic regulation of the conditioner so that it will maintain comfortable temperature and humidity conditions within the car—summer or winter.

Cooling units are divided into upper and lower sections to permit operation at one-half or full cooling capacity. Each section has a thermostatic expansion valve to regulate the flow of refrigerant according to the cooling requirements, plus a distribution manifold, which meters an equal quantity of refrigerant to each of the parallel passages through the unit.

The Frigidaire compressor-motor unit consists of a four cylinder, vertical reciprocating "Freon" compressor, driven by an enclosed 15 hp. motor. It is suspended under the car on shock-absorbing mounts, fully accessible for maintenance and service.

Refrigeration

Good food and relaxation are essential to the comfort and well-being of railway passengers. An efficient refrigeration system is necessary to provide these essentials. Refrigerated fixtures in each car operate automatically to maintain required temperatures, ranging from 50 degrees F. for drinking water to zero for frozen foods. Foods are kept fresh, appetizing and nutritious. Beverages are cold and sparkling.

The dining car has facilities for storing large quantities of fresh and frozen foods, affording more tempting menus and greater food choice. Eleven separate refrigerated

fixtures provide a total of 111 cubic feet of storage space—more than that provided in 15 standard size household refrigerators. As space is at a premium in dining car kitchens, each unit is of compact design and conveniently located.

A refrigerator at the right of the forward vestibule, opening into the kitchen, provides large food storage space and has a capacity to freeze 225 pounds of ice cubes every 24 hours. Within the kitchen itself, are an under-the-counter chef's refrigerator, a fish refrigerator, and a frozen food storage cabinet. In the pantry there are two service refrigerators, as well as individual cabinets for storage of ice cream and ice cubes. A refrigerated salad counter is also provided.

A refrigerator is installed in the dome compartment to assist in serving passengers who choose to dine on the upper level under the astra-dome. Eight cases of bottled beverages may be cooled and stored in the steward's refrigerator at the side of the stairs leading up to the observation dome. Four compact Frigidaire condensing units, concealed at different locations in the car, furnish dependable refrigeration for various fixtures.

Cooled Water in All Compartments

Cooled, fresh water is constantly circulated throughout the sleeping car and is on tap in all compartments. A special Frigidaire tank-type water cooler, concealed at the left of the rear vestibule, chills three gallons of water per hour, with refrigeration being supplied by a condensing unit near the cooler.

Ample supplies of ice cubes and cold bottled beverages assure the popularity of the cocktail lounge in the observation car. The large built-in refrigerator in the back bar is cooled by a Frigidaire condensing unit. The chair car is also equipped with a Frigidaire water cooler with a cooling capacity of three gallons per hour.

BASED on the prediction that 50 percent of all perishable foods will be preserved by freezing by the middle 1950's, an additional 360 million cubic feet of freezer space eventually will be required in public warehouses. Manufacturers believe the immediate market is for equipment to provide zero temperatures in at least 50 million additional cubic feet of storage space.



By DONALD F. DALY

THE problems of every contractor will be different and conditions will vary from place to place, but these observations on general business practices may be of some help to the individual operator. The first and most important thing for the new operator to bear in mind is—he must start immediately to build a set of job cost records. He should keep a complete record of all costs for material, labor, sub-contractors, permits, etc., from his very first day in business. This is the only way he can know definitely how much it is costing him to operate.

There are many simplified methods of keeping job records and the new contractor should avail himself of one of these systems at once. If he doesn't he is just kidding himself. In most towns and cities there are qualified accountants who handle the books of small business firms. Their cost is low, and is amply justified by the saving in time and effort to the contractor. It takes a lot of time



to keep an adequate set of books. Even when you know how. And if you don't know a lot about bookkeeping you are apt to find yourself in trouble when you start to make out your income and withholding tax reports, sales tax reports, payroll, job records, and other periodic summaries. It is far cheaper to have someone who knows the business to set up your books, and then follow the system he has set up. Above all—don't wait until your books are in a mess before calling in an expert. The best way is to have an accountant set up your books before you ever do a single piece of work.

Consulting Engineers

Even though a contractor has had years of experience as an application or service engineer, he still may need help in figuring the refrigeration requirements on certain jobs. Especially on large commercial and air conditioning jobs. In the past supply house operators have rendered a great deal of service along these lines.

Fourth Article

After completing a discussion of one method of estimating the cost of installation jobs in his first three articles, the author now turns to general business practices.

But at the present time they are having their troubles too, and simply do not have the time to do this work. I discussed this with Mr. Rauch of Rauch and Monroe just the other day. "We have to work overtime nearly every night, sometimes until midnight," said Mr. Rauch, "to keep our price line up to date. Prices are changing daily, and the trend is upwards. We have to keep our price line up to date if we are to keep our customers informed so they can submit their bids with some degree of assurance that they will be able to buy their material at the price quoted at the time the job was estimated. We would like to help our customers on this matter, and will continue to do so whenever possible. But, unless we set up a separate department to handle this work, we simply won't have the time."

The contractor who has a franchise for some major line of equipment can, in most cases, get such help from the manufacturers' branch in his area. In fact, the district dealer usually insists on checking the larger installations. His purpose is two-fold: he wants to render a service to his contractors, and at the same time insure that the equipment is installed in such a manner that it will be a credit to the manufacturer.

CONSULTING ENGINEERS

The refrigeration contractor is skilled at constructing and servicing refrigeration installations, and in many cases has the necessary technical knowledge and experience to design systems and select equipment. Contractors who are franchised by major manufacturers have at their command the services of the manufacturer's representative and the engineering staff of the manufacturer.

The independent contractor is not limited to one manufacturer's goods in making a recommendation to a customer, but if the work in question requires engineering skill beyond his experience, he may find it necessary to employ or recommend the services of a consulting engineer. This is especially the case with air conditioning work which involves a great deal more than refrigeration. The question of air distribution, duct design and winter design conditions can well be left to the experienced consulting engineer.

The consultant's commodity is his time, experience and unbiased opinion regarding materials and methods. His work can vary from engineering advice to complete plans and specifications, with or without supervision of the work.

Consulting fees

There are three methods of determining the fee charged by consultants:

- (a) Flat sum determined before starting work on the plans, with an agreement as to the extent of responsibility and work.
- (b) Cost plus a markup of a fixed amount, depending on extent of work. This may vary up to three times the engineer's payroll.
- (c) Fee based on a percentage of the cost of the work involved. This may vary up to 6%, depending on the extent of the work.

But the free-lance contractor is in a different boat. He has to carry the entire burden of estimating refrigeration requirements and costs on his own shoulders. At least that's what he thinks. This isn't exactly true. In this area, and I think the same thing will hold true in other parts of the country, there are consulting engineers who are in business for the sole purpose of engineering. They do not have anything to sell but their services, and by no stretch of the imagi-

nation could they be considered competitors.

Their fees are reasonable and well worth the price. It would be advisable for any contractor who finds himself in a position where he has to figure a job that he thinks is beyond his capabilities, to call on a consulting engineer. I understand that their fees are based on the amount of service they render. Such service might be anything from a rough outline of the equipment requirements, usually based on figures and measurements supplied by the contractor, to a complete engineering job including the drawing of blueprints, recommendations as to equipment and installation, and inspection to see that the work has been done according to the specifications.

Evaluating Competition

Contracting, whatever its form, is a gamble. A man has to be on his toes to figure out what his competitors are going to do, and then beat them to the punch. The contractor pits his skill as a business man and estimator against that of his opponents, and there are a great many more things involved than just making out a list of material and submitting a bid. When business gets back on a competitive basis, which won't be long, psychological factors will be making themselves felt and the war of nerves will be on.

To illustrate what I mean I cite an incident that occurred just the other day. I was in the office of Jack Frost (that's his real name incidentally), estimator and construction superintendent for one of the largest sales and service organizations in the Bay area. While we were talking he was handed a sheet of paper showing the results of a bid they had submitted recently. "Well," Jack snorted, "you wanted to know something about estimating. Here's an example of the sort of thing that has been occurring with increasing frequency lately. Last week we submitted a bid for the inspection and overhaul of the refrigeration equipment in a large factory building. They have a lot of equipment out there and we would very much like to have the account, so we made our bid low. There are forty-five self-contained water coolers, three ice cream cabinets, three reach-ins, and four small domestic boxes. Parts were to come extra. We bid \$7.50 per unit straight across the board. The next bidder gave a price of \$7.00 per unit straight across the board. But the firm who got the job bid \$1.00 per unit straight across the board."

"How can he hope to come out at that price?" I asked.

"He can't possibly come out," said Jack. "We would have lost money at the price we quoted, but we were anxious to get an in with this outfit. We were willing to take a small loss on this one job with the hope that we could get a contract for all of their new equipment and service work. But we can't afford to take that much of a loss."

"What will be the result of this bid?" I asked. "Will this low bidder get all future contracts with this company?"

"Not necessarily," said Jack. "Sometimes a bid like this backfires. This is a large concern and they know business conditions even better than we do. It may be that they will allow this contractor to do this one job, and that may be all he will get. They know that a contractor has to make a profit to stay in business, and it is pretty obvious that a profit cannot be made at these prices. It is entirely possible that their next big service job will be open for bids."

"In that case," I said, "your competitor is not going to gain a thing by his cut-throat practices."

Effect on the Field

"Well," Jack went on, "that isn't exactly true. A bid of this sort has a certain psychological effect on the competition. Some of them may jump to the conclusion that we are entering a period of cut-throat competition, and they may go out and bid a lot of jobs at very low prices. If they do and don't have money to throw away, they will soon eliminate themselves from the picture. It may be good business policy, but I doubt it. Of course, in this instance this bidder knows what he is doing. Sometimes they don't."

"How are you going to react to this situation?" I asked. "Are you going to enter into a race to see whose throat gets cut first?"

Jack laughed. "Not on your life. If he thinks we are going to be suckered into any such procedure he is very much mistaken. Let him go ahead. He may do all right for a while, but we were in business before he came along, and we will be in business after he is gone."

This may seem like an unusual case and some of you may think it "Can't happen here," but if you are still in business two or three years from now you may see even worse cut-throat tactics. Fortunately the firms who indulge in such practices are in the minority, but they do exist and while they are pursuing such a course they make it very tough for everybody concerned.

There are certain other practices which, while strictly legitimate, can make it very

tough for the uninitiated. It naturally occurs that some contractors are in a more favorable position than others. They have been in business longer, have all the necessary equipment, and what is more important, have this equipment paid for. They may have more capital, better business connections, and have over a period of time accumulated a large stock of parts and supplies. This stock of parts and supplies has, to a great extent, already been charged off, and like the fat on a hibernating bear, gives them something to go on during the periods when business is slow and competition is tough.

This gets us back to the point where we must consider building up a store of "fat" to draw on in times of lean business. I could never account for it, but as is the case with all business, refrigeration service and installation work seems to run

in cycles. When business is good it is very, very good, and when business is bad it is very, very bad. Therefore, it would behoove the average contractor to build up his layers of fat while business is good. Many sharp operators employ the practice of over-estimating their material requirements by as much as 25% on the jobs they do when business is good.

Another factor that sometimes serves to befuddle the novice operator occurs when a situation such as one that happened to me some time ago comes up. I had been operating in this area for some time and had my competition pretty well pegged. We hadn't been cutting each other's throats and our bids were always within a few dollars of each other. A job was open for bid and I wanted that job. It was a small installation and should have cost just about \$1,000.00. My bid was for \$800.00. Needless to say, I got the job. A few hours after the contract was let my competitors descended on me in a body.

"What the Hell is the idea?" they wanted to know. "Are you trying to ruin us? We know you can't do that job for \$800.00. There isn't that much profit in it."

I told them to calm down. That I wasn't trying to start a price war. That

(Continued on page 86)

Selecting bulbs to give More Light for Coolers

By J. C. FORBES*

A RECENT study¹ has shown that better lighting can be obtained in areas where low temperatures prevail by using fluorescent lamps. The problem is one of selecting the proper combination of lamp and type of fixture for the temperature in the cooler.

It is generally known that fluorescent lamps are simply glass enclosed mercury vapor arcs whose radiant energy impinges upon and activates fluorescent powders coated on the inside of the bulb wall. There is one bulb wall temperature at which such lamps operate at the greatest efficiency, and almost everyone has taken this to mean that fluorescent lamps are not designed for use at temperatures below normal room tempera-

tion (mercury arc energy output) is produced most efficiently. At temperatures higher than 100 F the mercury vapor pressure inside the lamp increases and the mercury vapor itself absorbs some of the magic "2537" (ultraviolet radiation) so that it never gets a chance to activate the phosphor.

In order to know which fluorescent lamp will operate best under certain conditions other than normal, it is necessary to determine the temperature-light output characteristics of various fluorescent lamps under normal conditions.

The key to the problem of knowing which lamp will operate best under conditions other than normal is to recognize that all fluorescent lamps do not operate at their

Table I.—General and Slimline fluorescent lamps grouped by temperature at which they operate best.

Group A Operate Best at Lower Temperatures	Group B Operate Best at Normal Temperature (60-80° F.)	Group C Operate Best at Normal to Higher Temperature
100-watt T17 bulb	40-watt T12 bulb	40-watt T17 bulb
30-watt T8	40-watt T12 (low temp.)	(low brightness)
15-watt T8	20-watt T12	96-inch T8 } 100 ma.
64-inch T6 } 200 ma. 42-inch T6 }	15-watt T12 96-inch T8 } 200 ma. 72-inch T8 }	72-inch T8 }
	64-inch T8 } 100 ma. 42-inch T6 }	

Note: Bulb sizes are designated by diameter, in eighths of an inch. Thus 100-watt T17 bulb is 100-watt lamp with 2½ inch bulb diameter.

ture. Efficiency drops if the bulb wall temperature is higher or lower than approximately 100 F. The reason for this is best explained as follows:

When the temperature of the fluorescent lamp bulb drops below 100 F some of the mercury vapor condenses and the internal vapor pressure drops below the point at which the magic "2537" ultraviolet radia-

most efficient level under normal conditions.

They may be divided into three groups according to their bulb wall temperatures. (Table I). For instance, there is a group of lamps, designated "Group A," which, under normal conditions (surrounding air—80 F), have high bulb wall temperatures. If the temperature of the surrounding air is dropped to 40 F they produce the same amount of light as they do when placed in an atmosphere of 80 F.

There is a group of lamps which will operate best at normal temperatures (60 to 80 F). There is still a third class, Group C,

¹ Diefenthaler, R. J. & Forbes, J. C.—Effect of External Factors on Light Output of Fluorescent Sources—*Illuminating Engineering*, Dec. 1945, Vol. XLI.

* Illuminating Engineer, Lamp Department, General Electric Co.

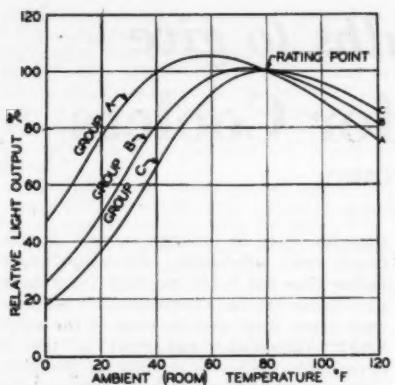


Fig. 1—Light output as affected by room temperature. Chart applies to fluorescent lamps (see Table I) operating bare in still air on ballasts supplying rated watts and current.

which operates best at normal to higher temperatures.

The relative amounts of light output for the different groups, as affected by room temperature are shown in Fig. 1. The curves apply to fluorescent lamps operating in still air on ballasts supplying rated watts and current. Thus for use in coolers, selection of one of the lamps of Group A is indicated. So much for the selection of the lamp.

Any type of luminaire or fixture which encloses the lamp or restricts the normal circulation of air around it will increase

the bulb wall temperature of the lamp. For instance, placing an open-end industrial type reflector (Fig. 2) over two 40-watt T12 bulb lamps reduces the air circulation so that their operating temperature is raised some 15 F. By further restricting the movement of air by the addition of closed ends on the reflector an overall temperature rise of the



Fig. 2—Open-end Industrial type reflector for 2-40 watt T12 fluorescent lamps. Addition of reflector raises operating temperature of lamps 15 F. (no draft).

bulb of 20 F is obtained. Enclosing the ends and putting a glass cover on the bottom of the reflector adds 25 F to the bulb wall temperature. As far as the lamps are concerned, therefore, the addition of certain reflectors or luminaires to house the lamps will have the same effect as placing a heat insulating jacket around the lamps.

From a practical standpoint, if fluorescent lighting is desired in a cooler operated at 30 F the addition of an open-end reflector over two 40-watt fluorescent lamps will raise the operating temperature of the lamps 15 F. The lamps themselves will be operating in an atmosphere of 45 F and their light output

Table II—Light Output (lumens*)—Lamp Only.

GROUP A—			Total Wattage	Room 80 F.	30 F.	0 F.
2 64" T6 Slimline, 39-watt }	Bare	102	4300	3880	2150	
	Reflector	102	3870	4510	3440	
	{ Reflector, Closed bottom	102	3650	4510	3680	
GROUP B—						
2 40-watt T-12 Instant Start	Bare	108				
	Conventional Start	96	4200	3300	1750	
2 40-watt T-12 Instant Start	Reflector	108				
	Conventional Start	96	3900	3780	2100	
2 40-watt T-12 Instant Start	Reflector	108				
	Conventional Start	96	3800	4000	2350	
GROUP C—						
2 40-watt T17-Instant Start	Bare	108	4200	2100	840	
	Reflector	108	4000	3350	1470	
	Reflector, Closed bottom	108	3900	3600	1890	
100-watt incandescent lamp		100	1630	1630	1630	

* Lumen values may be used in lighting design calculations. Reflectors reduce light output in proportion to reflector efficiency.

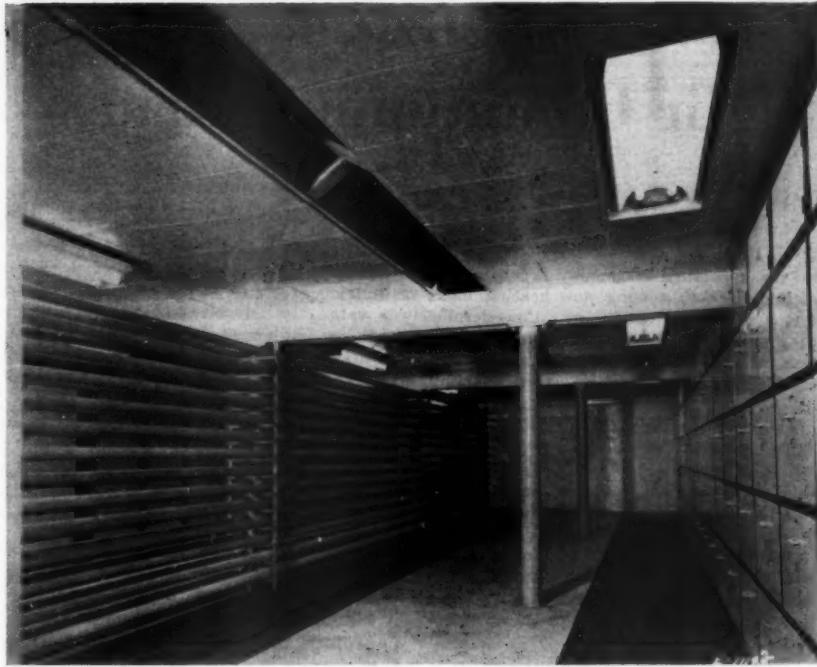


Fig. 3—Two lamp industrial type units employing the regular 40-watt instant start lamp on instant start ballasts operate satisfactorily in this zero temperature cold storage locker. The use of reflector over the two lamps and then recessed into ceiling brings about a temperature rise of approximately 20° around the lamps so that lamps are in effect operating in an atmosphere at 20° instead of 0°. Exposed lamps will not provide the same light output as lamps in reflectors.

will be 85 per cent of normal. If the lamps were operated bare in the same location light output would be only 65 per cent of normal.

If one of the lamps included in Group A were used instead of the 40-watt lamp (listed in Group B) results would be even better. Light output could be greater than 100 per cent of normal. It is evident that the amount of light these different combinations of lamp and reflector will give in a cold storage room can be established and the combination which will give the best results can be determined.

Table II establishes the light output of one type of lamp from each of the three groups—A-B-C.

1. The 64-inch T6 Slimline at 200 milliamperes—Group A

2. The 40-watt T12 general line—Group B

3. The 40-watt T17 low brightness—Group C

Data are presented for these three lamps operating under three different conditions, the first being bare in still air; the second with two lamps placed parallel in an open-end industrial type reflector, and third in a reflector which has closed ends and a clear glass panel on the bottom. The table gives lamp lumen output figures at room temperatures of 80 F, 30 F, and 0 F.

It is to be noted that the total wattage for the three types of fluorescent lamps and for the filament lamp considered is approximately the same. Therefore, the load on the cooling equipment can be computed at the same rate for each, as the heat generated is directly proportioned to the wattage.

It is readily seen that by choosing the proper combination of lamp and reflectors, it is possible to get at 30 F over 2½ times the light output of a 100-watt filament lamp

(Continued on page 84)

Simplified Calculation of Air Conditioning Loads

By EDWARD DOWIS

SUFFICIENT data has been compiled, to make possible reasonably accurate prediction of both cooling and heating loads for almost any conditions. Considerable progress has been made in simplifying the task of compiling an estimate, while still allowing for the various factors affecting it.

The estimate sheet recommended by the Self-Contained Air Conditioner Section of Air Conditioning and Refrigerating Machinery Association, Inc. is the most recent standardized method to have the approval of a representative industrial group. It is probably unique in that it contains all necessary coefficients and formulae on the sheet, while accounting for all the usual heat sources. This sheet is reproduced here-with.

Heat Sources

A knowledge of the simple basic factors governing heat gains and losses in buildings will enable the air conditioning man to simplify the use of any standardized method or to compile an estimate of his own for any specific conditions. Heat enters a building from five sources:

1. Conduction through walls, floor, ceiling, etc.
2. Direct radiation from the Sun.
3. Heat in air entering from outside.
4. Heat given off by people.
5. Heat from appliances, lighting, cooking, etc.

Properly selected equipment will remove heat at the same rate as it is received when inside desired conditions are being maintained during most unfavorable circumstances.

Sensible and Latent Heat

Heat enters a conditioned space in two forms, known as sensible and latent heat. It is desirable to know the proportion of each kind of heat which makes up the total

load in order to select or operate a system efficiently. Sensible heat is that which raises the temperature of a substance, such as air or water. Its intensity is indicated with an ordinary thermometer. Latent heat can not be determined by an ordinary thermometer, but is indicated by the state of a sub-

The air conditioning service engineer should be able to quickly determine the rate at which heat and moisture must be removed or added to a room or structure in order to maintain desired conditions. The simplified method explained here will be suited to the greater percentage of the work he encounters.

stance: That substance, in air conditioning, is water vapor. It requires the removal of heat to condense water vapor and the addition of heat, to cause water to evaporate. Since, in most climates, it is necessary to remove water vapor, or latent heat, as well as reduce the temperature of the air by removing sensible heat, the amount of each which is to be absorbed, should be known. Sufficient data has been compiled to make an accurate prediction of the heat gain to be expected for an usual type of construction or usage, under any usual climatic condition. A brief explanation of the method of calculating sensible and latent heat gains from each source, is in order.

Conduction

One source of heat, all sensible, is that which is transmitted through walls, ceilings, floors, etc. due to the difference in temperature between outside and inside. The rate of conduction heat gain is determined by the difference in temperature, the type of construction and the area of surface. The American Society of Heating and Ventilat-

COOLING LOAD ESTIMATE

*Recommended Practice for Members of
Self-Contained Air Conditioner Section of*

This estimate is suitable for comfort air conditioning jobs not requiring specific conditions of temperature and humidity.

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AIR CONDITIONING AND REFRIGERATING MACHINERY ASSOCIATION, INC.

Customer:	Buyer:	Space to be used for	Approval:	Date:
Address:				
Estimate by:	Date:			
1. People.....	(Number Sitting or Moving Slowly).....	X 400 =		
(Number Working, Dancing or Similar Activity).....		X 600 =		
2. Windows Exposed to Sun.....	(Total Sq. Ft.).....	X	A =	
(Figure this item for the one sun exposure having largest window area)				
3. Lights and Electrical Appliances.....	(Total Watts in Use).....	X 3.4 =		
(Include in this item only those appliances not listed in Table B)				
4. Other Heat Sources.....		B =		
5. Sub-total—Sum of Items 1 thru 4.....		=	C =	
6. Windows Not Included in Item 2.....	(Total Sq. Ft.).....	X	C =	
7. Walls and Partitions.....	Sq. Ft.—Windows.....	X	C =	
	Sq. Ft.—Windows.....	X	C =	
	Sq. Ft.—Windows.....	X	C =	
8. Floor.....	(Total Sq. Ft.).....	X	C =	
9. Ceiling.....	(Total Sq. Ft.).....	X	C =	
10. Ventilation or Infiltration.....	(Cu. Ft. per Min.).....	D X	E =	
11. Sub-total—Sum of Items 6 thru 10.....		=		
12. Total Btu. per hour Cooling Load to be used for Selection of Unit—Sum of Items 5 and 11.....		=		

COOLING LOAD FACTORS

WINDOWS EXPOSED TO SUN—SOLAR RADIATION FACTORS FOR DIFFERENT ORIENTATIONS TO BE INSERTED AT A	N	E	EE	S	SW	W	NW
Clear Glass (Single or Double) No Protection.....	110	A	350	360	165	180	180
Shaded Inside Blinds or Venetian Blinds.....	35	B	50	45	20	25	30
Light Colored Inside Blinds or Venetian Blinds.....	45	C	95	90	45	50	55
Glass Brick No Protection.....	44	D	72	64	42	54	72

OTHER HEAT SOURCES TO BE INSERTED AT B

Beauty Parlors.....	Number of Operators.....	X 2000 =	
Electric Motors.....	Total Name Plate HP.....	X 2800 =	
Gas Burners.....	Number.....	X 6000 =	
Glass Coffee Makers.....		X 900 =	
Coffee Urns—Gas or Electric.....	Coffee Capacity in Gallons.....	X 1400 =	
Steam Tables—Electric.....	Sq. Ft. Area of Top.....	X 550 =	
Steam Tables—Gas.....	Sq. Ft. Area of Top.....	X 1300 =	
Additional Heat Sources.....		BTU/Hr. =	

*Factors for appliances equipped with heat and positive exhaust should be reduced by 50%.

Insert Total At B

WINDOWS, WALLS, FLOORS AND CEILING TRANSMISSION FACTORS FOR VARIOUS OUTSIDE DESIGN TEMPERATURES—INSERT AT C	50	57	65	80	90	92	95	96	97	98	99	100	101	102	103	104
Outside Dry Bulb °F.....																
Windows—No Glazing.....	85	90	115	12	14	15	16	17	18	19	20	21	22	23	24	25
Walls—Hollow Block.....	85	90	115	12	14	15	16	17	18	19	20	21	22	23	24	25
Walls—Average Masonry.....	95	100	135	14	16	17	18	19	20	21	22	23	24	25	26	27
Walls—Insulated Masonry or Frame.....	105	110	145	15	17	18	19	20	21	22	23	24	25	26	27	28
Partitions—Single Wall.....	115	120	155	16	18	19	20	21	22	23	24	25	26	27	28	29
Partition—Inside, Single Thickness.....	125	130	165	17	19	20	21	22	23	24	25	26	27	28	29	30
Partition—Inside, Double Thickness.....	135	140	175	18	20	21	22	23	24	25	26	27	28	29	30	31
Partitions—Outside, Single Thickness.....	145	150	185	19	21	22	23	24	25	26	27	28	29	30	31	32
Partitions—Outside, Double Thickness.....	155	160	195	20	22	23	24	25	26	27	28	29	30	31	32	33
Glass Brick (No Sun Exposure).....	165	170	205	21	23	24	25	26	27	28	29	30	31	32	33	34
Floor.....	175	180	215	18	20	21	22	23	24	25	26	27	28	29	30	31
Ceiling Under Unventilated Attic°.....	185	190	225	19	21	22	23	24	25	26	27	28	29	30	31	32
Ceiling Under Ventilated Attic°.....	195	200	235	20	22	23	24	25	26	27	28	29	30	31	32	33
Ceiling Under Flat Roof°.....	205	210	245	21	23	24	25	26	27	28	29	30	31	32	33	34
Ceiling Under Occupied Floor°.....	215	220	255	22	24	25	26	27	28	29	30	31	32	33	34	35

*Adjust factor selected from this table if Ceiling is insulated. Example: 4° Insulation—0.3 X Selected Factor = Adjusted Factor.

1° Insulation—0.4 X = 2° Insulation—0.3 X = 4° Insulation—0.3 X = =

VENTILATION OR INFILTRATION QUANTITY TO BE INSERTED AT D

Calculate Requirements for Both Ventilation and Infiltration and Use Larger Quantity Cu. Ft. per Minute (CFM). Use No Less CFM than Required by Local Ordinance, and no less than amount drawn from space by exhaust fans if used.

VENTILATION REQUIREMENTS

SMOKING	No. OCCUPANTS	C.F.M.	D
None		X 7½ =	
Light		X 15 =	
Heavy		X 40 =	

(H) = Room Height (L) = Length (W) = Width (G) = Wall Factor

Two outside walls (G) = 1.5

Three or more outside walls (G) = 3

C.P.M. = (H) X (L) X (W) X (G) =

60

VENTILATION OR INFILTRATION FACTOR FOR VARIOUS OUTSIDE DESIGN TEMPERATURES IN °F.W.B. TO BE INSERTED AT E

Outside Wet Bulb °F.	50	57	65	67	70	75	78	79	80	82	84	85	87	88	89	90
Factor	6	1	3	5	11	14	17	20	23	27	30	33	37	43	49	50

Cooling load estimate sheet reproduced through the courtesy of Air Conditioning and Refrigerating Machinery Association, Inc.

ing Engineers, in their guide book, have published heat transfer coefficients for a great variety of construction materials. Due to the fact that any one wall may have a variety of materials such as brick, tile, furring, lath and plaster, an overall coefficient for the type of construction is most convenient to use. This coefficient is the number of Btu. per hour transmitted through each square foot for each degree difference in temperature. When this coefficient is known, the conduction heat gain can be determined by the following formula:

CONDUCTION COEFFICIENTS FOR DIFFERENT TYPES OF CONSTRUCTION

(Btu. per hour per square foot per degree difference in temperature)

Type wall or partition	Conduction Coefficient
8" brick, plaster directly applied.....	.46
8" brick, plaster on wood lath.....	.3
12" brick, metal lath, plaster.....	.25
8" hollow tile, plaster on metal lath, outside stucco27
Brick veneer, sheathing, studding, plaster-board and plaster.....	.27
Same as above with mineral wool between framing073
Gypsum tile, plaster both sides (4").....	.27
Frame partition, wood lath and plaster both sides.....	.34
Frame ceiling or floor, wood lath and plaster and wood floor.....	.28
Pitched roof, asphalt shingles, plasterboard and plaster inside, no insulation.....	.33
Above with 3" Insulation.....	.083
Glass windows and skylights	
Single	1.1
Double45
Triple28
Doors, solid wood, 1½".....	.46

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Conduction heat gain = Area x coefficient x temperature difference. Where there are walls of different construction, or separating the conditioned space from spaces of different temperatures, the formula should be applied to each wall, ceiling or floor and the results added to get the total conduction load. For complete list of coefficients, the reader is referred to the current issue of the "Heating, Ventilating, Air Conditioning Guide." A list of commonly used coefficients is listed herewith.

Solar Gains

Solar heat gains, also sensible, are those due to the direct rays of the Sun striking glass windows, walls, roof, etc. The Sun's rays do not strike all sides of a building or space at the same time, or with equal intensity. Dark colored roofs and walls and un-

shaded glass admit more heat from direct Sun rays than do light colors and shaded windows. The latitude of the building location has some effect on the heat transmission. There is also a time lag, between the time the Sun's rays strike a roof or wall, and the time that that heat is transmitted to the space inside. This differs with different types of construction. Solar heat does not have to be added for installations when the maximum cooling load does not coincide with the solar load. For instance, a restaurant in the east side of a business building, with a maximum load in the evening. With so many variables, it is obvious that very accurate estimates of solar heat gains require considerable calculation.

Where extreme accuracy is not required, allow 65 to 180 Btu. per square foot of glass exposed to solar rays; the larger figure for direct exposure through unshaded windows, and the smaller for indirect exposure through shaded windows.

For roofs, directly over the conditioned space, allow 30 to 60 degrees additional to the regular conduction heat gain temperature difference, the amount to be used, depending upon the color of the roof, and the time when the heat load is at the maximum. The maximum solar load is about noon to 2 P.M., and for dark colored roofs. The minimum figure would apply for light colored roofs, where the maximum load occurs about 8 to 10 A.M. or 5 to 7 P.M.

For walls, 10 to 30 degrees should be added to the conduction temperature difference, the figure depending on the color of the wall, directness of exposure and time of day. For accurate calculation, tables such as those referred to in the A.S.H.V.E. guide referred to, should be consulted.

It should be emphasized that solar gains should be calculated only for walls, roofs and openings exposed to solar rays at the time of maximum total cooling load.

Heat in Ventilating or Infiltrated Air

Both sensible heat and moisture are brought in by air used for ventilation or by that which enters through openings around doors and windows. Ventilating requirements vary from $7\frac{1}{2}$ to 25 cubic feet per minute or more, depending usually, upon the amount of smoking and fumes which must be eliminated. 15 Cfm. is a good average, in which the Cfm. of air for ventilation will be Number of persons \times 15.

Where ventilating air is not introduced artificially and where the conditioner handles entirely recirculated air, figure $\frac{1}{2}$ to 2 air changes per hour, depending on the number of openings. 2 is usually the figure used for stores. Thus, for a store 30' x 80' x 10' high, we would allow $30 \times 80 \times 10 \times 2$ or 48,000 feet per hour: Dividing by 60 we have 800 cubic feet per minute.

Heat must be absorbed to reduce this air to the temperature of the conditioned space. Moisture will also have to be removed if the moisture content of the outside air exceeds that of the conditioned space. An article in the October, 1946 "Refrigeration Service Engineer" by this writer, outlines the methods of determining sensible, latent and total heat necessary to change air temperature and humidity. Reduced to simple formulae, the sensible cooling load for outside air Btu. per hour = Cfm. x 4.5 x temperature difference x .241. The figure 4.5 is a constant which reduces Cfm. of standard air to pounds per hour and .241 the specific heat of standard air.

Where extreme accuracy is not required, the latent heat may be assumed to be about equal to the sensible. For greater accuracy, a heat table reprinted with the article just referred to gives total heat content of air for various wet bulb temperatures. Substituting heat content difference for temperature difference in the above formula

will give total heat. Subtract sensible heat and the balance will be latent.

Heat from People

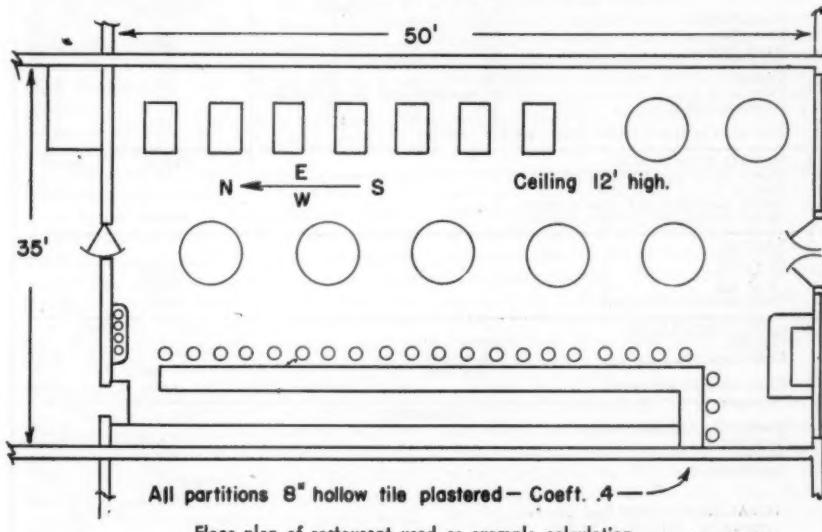
The average person will radiate about 225 Btu. per hour sensible heat and 175 to 450 Btu. latent heat due to moisture from breathing and perspiration. The figure of 175 is for persons sitting quietly and 450 for those actively working. Total heat gain from people is, therefore:

$$\begin{aligned} \text{Total number } \times 225 &= \dots \text{Sensible} \\ \text{Number at rest } \times 175 &\dots \text{Latent} \\ \text{Number working } \times 450 &\dots \text{Latent} \\ \text{Total} &= \\ \text{Occupancy Latent heat load} &\times \text{Sensible.} \end{aligned}$$

Appliance Load

Electric lights, electric appliances, gas and steam heated devices of all types, add to the cooling load. Those which give off vapor, such as cooking ranges, open gas flames, etc. give off latent, as well as sensible heat.

The electrical appliance load, including lighting, will be $3.4 \times$ the number of watts used. The wattages of appliances as actually used, and not name plate readings, should be used. An electric range may be rated at 5000 watts, but only 2500 normally used. The heat load for the range would be 2500×3.4 or 8500 Btu. per hr.



Appliance load should be added only for those appliances in use at the time of maximum load. Gas heated appliances are rated in Btu. per hour. A few typical commercial appliances have heat losses approximately as follows, as normally used:

	Sensible	Latent	Total
Coffee urns (per gal. capacity)	500	500	1,000
Glass coffee makers (per section)	800	100	900
Steam tables (per sq. ft. top)...	1,000	1,000	2,000
Plate warmers (per sq. ft. top shelf)...	600	...	600
Restaurant range including oven	75,000	25,000	100,000

When properly hooded with exhaust fan ventilation, these estimates should be reduced about 50%.

Compiling Estimate

An estimate similar to the one illustrated, should be made for each job. To illustrate, assume it is desired to estimate the cooling load for a restaurant seating 75 customers, facing south; front and rear walls exposed, unconditioned store rooms on either side, basement used for storage underneath, unconditioned apartment above, dimensions as illustrated. The estimate sheet is also shown.

Judgment has to be exercised in determining the temperature differences at each wall. The North wall adjoins the kitchen. It's coefficient is .4. A 15 degree difference is assumed because part of the wall is protected by a walk in cooler and because the kitchen is ventilated thoroughly by a separate exhaust fan (not shown). Otherwise a 20 or 25 degree difference might have been more correct.

East and West walls, adjoining uncon-

(Continued on page 84)

SUMMER COOLING ESTIMATE SHEET

Name.....

Address.....

Type of occupancy .. Restaurant

Time of maximum load... 12 noon to 2 P.M.

1. CONDUCTIVITY AND SOLAR HEAT GAIN

	Sq. ft.	Heat Coeff.	Latent	Temp. Difference	Btu. per Hr.
North Wall	420	X	.4	X	15
East Wall	600	X	.4	X	10
South Wall	210	X	.3	X	25
West Wall	600	X	.4	X	10
Ceiling	1,750	X	.28	X	10
Floor	Over basement used for storage only.				0,000
Glass exposed to sun	210	X	.65		13,650
	210	X	1.1	X	15
TOTAL CONDUCTION AND SOLAR Sensible					30,670

	Latent	Sensible
2. VENTILATING LOAD People $80 \times 15 = 1200$ C.F.M. $1200 \times 4.5 \times 15 \times 24$		19,440
Latent Heat assumed same as sensible for preliminary estimate. See text	19,440	

	13,125	18,000
3. PEOPLE 80×225		
75×175	13,125	
5×450	2,250	
Total sensible and latent	15,375	18,000

	340	3,200
4. APPLIANCE LOAD Lighting	1,000 X .34	
Coffee makers	4 X 800	
	4 X 100	400
Total sensible and latent		400

SUMMARY

Conduction and solar heat	30,670
Ventilating	19,440
People	15,375
Appliance	400
	35,215
	71,650
TOTAL HEAT GAIN Btu. per Hr.	106,865
TONNAGE, $106,865 + 12,000$	8.9 Tons

Having trouble Getting Supplies? Get Yourself a Plane

By HAROLD MELVILLE PEER

MR. WHOLESALER, are you having trouble getting supplies from the manufacturers from whom you buy? If you are don't blame the manufacturers. The truth of the whole matter is that you are just too old fashioned for this modern post-war world that the soldiers and politicians have made for us. Don't waste time writing letters, telephoning long distance or telegraphing. That's too old style for 1947. Get yourself a plane and presto the red carpet will be run out for you at any manufacturer's factory where you choose to fly. The President himself, accompanied by the Vice President, Secretary and Treasurer of the firm will majestically come down that red carpet to greet you with all the courtesy of salesmen trying to land business in the midst of a panic. The world will be yours together with the supplies you seek.

In case you are not quite willing to take the word of a reporter for all of this, drop in on Frank S. Langsenkamp, Secretary-Treasurer of the F. H. Langsenkamp Co. of Indianapolis, Ind. Mr. Langsenkamp was old fashioned at one time just as you and the other fellow. And like you and the other fellow he wasn't doing any too well getting supplies for his firm. At least that is what he thought so he decided to do the most modern thing possible, get a plane and take to the air.

"Now when supplies are coming in slowly—or not at all as is sometimes the case," says Mr. Langsenkamp, "I just get in my private plane and head for the factory or factories that make what I want and need.

As soon as I land at the local airport I phone to the manufacturer and tell him that I have just flown in from Indianapolis in my plane and will be right up to see them."

That, brother, does the trick. By the time Mr. Langsenkamp has arrived at the factory, the red carpet has been rolled out just as when Marie of Roumania visited the Mayor of New York City. The President

OFFER OF FREE PLANE RIDE WITH \$1,000 ORDER GETS BUSINESS

SENDING a plane up in the air to do some sky writing is not such a new advertising stunt any longer but offering a free plane ride to every customer who buys \$1,000 worth of supplies—well that is something new. Yet that is just what the Evansville, Ind., branch of the F. H. Langsenkamp Co. of Indianapolis, Ind., did in opening its branch. And it went over like the well known house afire.

Frank S. Langsenkamp, Secretary-Treasurer of the Langsenkamp firm is a flying enthusiast. He owns an Ercoupe two place spin proof two control metal plane with fabric wings that he uses to fly around the country to visit his suppliers in order to hustle up deliveries. When the Evansville branch was opened the branch offered a free plane ride over Evansville to every customer who purchased \$1,000 worth of supplies. The customers were taken up one at a time for a short ride, to be sure, but it was very much of a novelty to all of the customers and proved a real incentive to buy thus starting the branch off with a sales bang.

and the rest of the dignitaries of the firm are on hand to extend the glad hand. And from the time the hand shaking is over until Mr. Langsenkamp starts for the airfield again, it is a case of "what can we do for you?" "you bet we'll ship you some goods today," "any time you want anything let us know" and so on and on and on.

Maybe all of this sounds like something written in Washington, D. C., so let's take an actual experience of Mr. Langsenkamp. A certain supplier was not shipping much needed supplies so Mr. Langsenkamp took his plane and flew to the city. He phoned the firm from the airport and took a taxi



F. S. Langsenkamp and the Ercoupe he uses to aid him in getting both the supplies he needs and the customers to sell them to.

to the firm's office. The whole roster of officers of the firm met him, extended the glad hand and were all ears. Mr. Langsenkamp told them that he absolutely needed certain supplies and needed them very badly.

"Come on in and we'll talk with the Production Superintendent," suggested the President as he led the way to the Superintendent's office.

After the usual introduction the President told the Superintendent that Mr. Langsenkamp was one of their best customers and that he had to have such and such supplies.

"We have his order on file for just those things," said the Superintendent.

"On order, hell, that won't do at all," snapped the President. "He has to have them right now. Look up your stock records."

"There are just three cases on hand, now," said the Superintendent after he had looked up the stock records.

"Fine, send one of them to Langsenkamp today," ordered the President. Before Mr. Langsenkamp returned to Indianapolis that

same morning he took the President of the firm up for a little trip over the city. It was the President's first plane trip.

"That's fine," smiled the President as he said good-bye to Mr. Langsenkamp at the airport. "I sure am obliged to you for the trip. And whenever you need anything let me know personally and I'll see that you get it at once."

The plane that Mr. Langsenkamp uses is an Ercoupe, two-place spin-proof two-control metal plane with fabric wings. It has a cruising range of about four and a half hours, flying at from 100 to 110 miles per hour. He houses the plane in a private hangar in Indianapolis. To get to the plane Mr. Langsenkamp drives to the hangar in his car. After taking the plane out of the hangar he drives his car in and uses the hangar as a garage until he returns from his trip, when he drives the car out of the hangar and puts his plane in.

As a time saver it is beyond reckoning. More than that it adds prestige to both Mr. Langsenkamp and the firm of which he is an officer. But even more than all of that it gets the supplies.



QUESTIONS and ANSWERS

On Problems of Servicing and Installation of Refrigerating Equipment—Send Your Problems to the Question Box.

MEAT DARKENS IN CASE

QUESTION 793: I had a call on a double duty McCray ten foot meat counter with the complaint that the meat was turning dark after being in the case a few hours. This case has a $\frac{1}{2}$ hp. Servel compressor with methyl chloride as refrigerant.

I found the coils not defrosting completely. After setting the switch to come in at 26 pounds and out at 6 pounds the temperature was too high. (This case has a natural draft top coil vertical coil in back of bottom of case with refrigerant feeding in top of coil and out bottom.) After installing a new thermostatic expansion valve I had the same condition. I finally had to set the switch at 22 pounds in and 0 pounds out to get a temperature of 33 to 35 degrees in bottom and 35 to 37 degrees in top. The meat continues to turn dark in a few hours.

This case is in a small grocery using an open type natural gas stove. They have not been using any new insecticides or cleaners on the case. The case has been in operation for about three years and has not given any trouble.

ANSWER: Generally speaking, when you have dehydration of foods in a refrigerator, it comes about through too great a temperature difference between the box temperature and the coil temperature. This could mean a faulty expansion valve operation, either caused by a starved coil or possibly from the valve not closing off tight, during the off cycle.

We would suggest that you first check the fixture and see that no paper has been placed on the shelves to block normal routes of air circulation, and the next thing to check would be the even frosting of coil during the on cycle. The frost should pull all the way through the coil, and this includes both the coil in the top and one in the base. If the coil is not frosting properly, then check the expansion valve, first to see that the bulb is attached in the proper place, and fastened securely to give good contact,

and next that the valve is open far enough to assure complete flooding of the coil.

For methyl chloride, the pressurestat should be set to cut in when the coils have completely defrosted and to cut out when the temperature on the main shelf is from 36 to 40 degrees. This would give control settings of roughly 25 to 27 lbs. cut in and 5 to 8 lbs. cut out.

We would also recommend giving the compressor an efficiency test to see that the compressor valves are not leaking. At the same time, the condenser can be checked to determine if it is plugged or if the air passages are restricted, causing undue head pressure.

The fact that the service man finds it necessary to cut the control out at 0 lbs. to get the average 36 degree temperature on the main shelf, indicates something is wrong.

THE TEMPERATURE OF THE SYSTEM

QUESTION 794: How can the temperature of the head be determined when we know the suction pressure and discharge pressure?

Why does a methyl chloride compressor seem to be hotter than a "Freon" compressor of comparable capacity?

ANSWER: The theoretical temperature which will closely approach the actual is obtained from the superheat tables of the refrigerants. For example: if a "Freon" unit is operating at 28 lbs. suction and 115 lbs. discharge, the discharge temperature can be approximately computed as follows: Assume the suction gas is superheated 20 degrees. Its final temperature will then be (from superheat tables) 27.7 degrees. At this pressure and temperature the entropy is given as .1761. This is the heat content expressed in an arbitrary term. Now by referring to the superheat table at 130 lbs. (115 + 14.7) and following down the temperature column to .1761 we find (by interpolation) the gas discharge will be 185 degrees.

On approximately the same temperature basis, the methyl chloride machine will be as follows: 16 lbs. suction and 85 lbs. discharge.

Again assuming a 20 degree superheat in the suction line, the entropy will be .4503 and the temperature 256 degrees.

WHY DRYER WARMS UP

QUESTION 795: I am wondering whether the following questions can be answered in one of your issues. I feel that it would do more good for more servicemen that way.

Referring to the "Freon" and methyl chloride refrigerants, particularly to methyl chloride, and in conjunction with the use of Silica Gel dryers in said system, what are the causes and possible indications of the following phenomena:

1—A fresh dryer will warm up and at times even heat up to a great extent when the refrigerant passes through it for the first time. Is this caused by the refrigerant, moisture, or both?

2—Does the gradual disappearance of heat in the dryer indicate that: (a) it has absorbed all the moisture in the refrigerant, or (b) that the Silica Gel has been used to capacity and can no longer absorb any moisture that may remain in the system?

ANSWER: The above question was referred to Dr. Walter O. Walker, Director of Research and Development, Ansul Chemical Co. His reply follows.

Tests which we have recently carried out, and which directly bear upon question No. 1, prove that a fresh drier charged with silica gel or activated alumina will warm up even when perfectly dry methyl chloride or "Freon 12" is admitted to it. There is an additional heat effect when moist methyl chloride or moist "Freon 12" are admitted to drier units charged with silica gel, activated alumina or Drierite. This heat effect is due entirely to the absorption of moisture.

Concerning answer to question No. 1, the gradual disappearance of heat in the drier could be due to the fact that expansion of the refrigerant into the drier unit produced some cooling effect and therefore counteracts any heat effect which might be present. In the case of Drierite and in the absence of any refrigerating effect, disappearance of the heat might mean that the Drierite had absorbed all the moisture it could hold. However, in a little time, if no heat was supplied to the drier unit, whatever heat was present would be dissipated by the cooling effect of the surrounding atmosphere.

It seems to us that trying to determine the "freshness" of a drier on the basis of the heat effect produced when used in a liquid line, is open to considerable criticism in that it does not prove that a drier charged with silica gel or activated alumina is in good

condition. The heat effect can be gotten with perfectly dry refrigerant. However, in the case of Drierite this criterion might be satisfactory provided it was not completely or partially masked by the refrigerating effect at the beginning of admission of refrigerant to the drier unit.

We have just completed making some measurements of the actual heat effects involved in these three driers with methyl chloride and "Freon 12." All of our work is incomplete at the present moment due to the fact that the man who was doing the work has been ill for the past month. However, we expect to have some fairly complete information concerning this subject and in due course will publish it.

MEAT COOLER

QUESTION 796: A cooling room in a butcher shop is to be kept at 36 to 38 degree temperature. The room size is 14 ft. long by 6 ft. wide and 12 ft. high. There are 4 inches of cork insulation on the wall which is concrete block 8 inches thick. The door is 3½ ft. wide, 6 ft. high and about 6 inches thick. Two units hang on the ceiling with a fan on the back to drive the air through the unit. Each unit is 17 inches high, 21½ inches long and 14 inches wide. The model is OC-84, Serial No. 846765—American Coil Co., New York, N. Y. Refrigeration is furnished by two 1 hp. Universal Cooler Corporation condensing units Model W-11-XFS. "F-12" refrigerant is used

There are, at times, 1000 to 1500 pounds of beef cooled to air temperature and then put in this cooling room to be cooled to 36 F. Also four or five hogs about 300 pounds each are put in the room to be cooled before being cut up. The hogs are cleaned before they are put in the room. I claim the unit is too small to do the work, as both units run continuously and do not get much below 40 degrees.

I was thinking of making a coil of 100 ft. of ½" copper tubing for each unit, and fastening the coil to the wall—one on each side of the room. Will this work satisfactorily? What is necessary to make this system work more efficiently?

ANSWER: Your question does not state how often the 1500 lbs. of beef and the approximate 1500 lbs. of pork are placed in this refrigerator. In other words, you do not give me an indication of how much meat per hour or per day is to be cooled. I assume, however, there is an approximate 3000 lbs. of meat placed in the cooler daily and it is after loading the cooler with this amount of meat that the difficulty arises.

If my assumptions are correct then your

condensing units are not large enough to take care of the job. The capacity of two 1 hp. units is sufficient to cool that load of meat during the course of 14 to 16 hours, but it would mean continual running. There is not sufficient pull down capacity to handle the load and allow for idle time.

In dealing with such problems we must remember that fresh killed meat is at a temperature of approximately 98 degrees. Furthermore, there is a great deal of moisture removed from the meat in the process of removing animal heat. This moisture, plus the temperature reduction, places a severe load on the refrigerating equipment for the first few hours.

YORK AMMONIA SYSTEM

QUESTION 797: I would like to get some information on a small ammonia plant I have been servicing. It is a 3 hp. job, cooling a walk-in cooler. The cooler is equipped with pipe coils with an accumulator tank at the outlet. This system uses a high side float valve located near the receiver tank. The line from the high side float leads up to some sort of an intermediate pressure valve just before it enters the box. The line is formed into a long loop of about 3 ft. after it enters the box and then feeds up into the coil.

Would you say a system of this sort is critical of charge? Recently the line from the high side float to the intermediate pressure valve is real cold and frosts up. It has not affected the refrigeration as yet. Could a shortage of refrigerant cause this, or is it a sure indication that the intermediate pressure valve is sticking open?

Could this system be changed over to a thermostatic expansion valve job with the present piping arrangement, or would the accumulator tank have to be removed?

This is an old York system, and any information you can give me on it will be greatly appreciated.

ANSWER: The high side float ammonia system you are servicing is critical in its charge of refrigerant. All high side float systems, whether ammonia or any other refrigerant, are critical in the proper amount of charge. Of course, ammonia systems often have an excess of evaporator coil and therefore may not be too critical on the amount of refrigerant. It merely means that some of the last turns of the coil may not frost if the charge is insufficient. If there is too much charge in the system, the frost may extend all the way through the suction line to the compressor.

The intermediate pressure valve you speak of, located between the high side float and the coil, is for the purpose of preventing the liquid line from frosting. It maintains the

pressure in the liquid line so that no expansion takes place and no frosting of the liquid line occurs. If this valve is not functioning properly, the liquid line may frost. However, it will have no effect on refrigeration or in the operation of the rest of the system.

A system of this type can be changed to a thermostatic expansion valve. The accumulator tank would not have to be removed but it would be necessary to place the feeler bulb of the expansion valve between evaporator coil and accumulator.

FROZEN FOOD CABINET

QUESTION 798: I have a 16 cu. ft. frozen food cabinet with 2 Yoder plates—one on each side. This is a thermostatic expansion valve system, using "F-12." It has been in operation for about two years. The gas charge is O.K., and about 8 oz. of oil has been added to the compressor at one time for oil loss when disconnecting compressor for moving.

The last plate on the circuit will not frost through, causing the compressor to run too much. I have removed the valve control bulb and warmed it by hand and the valve responds O.K. flooding both plates. I have added alcohol for moisture trouble. The last plate will frost over for a while and then defrost.

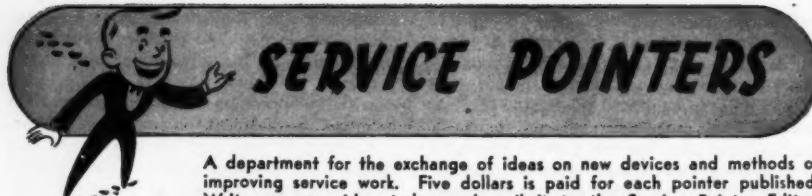
Please advise what I can do to remedy this condition.

ANSWER: Your trouble with the refrigerating system in the frozen food cabinet is due to the expansion valve and since the expansion valve responds to warming of the bulb with your hand, it would seem that the trouble is most likely due to the location of the thermal bulb. Perhaps it is in such a location that it is feeling the temperature from the inner walls of the refrigerator and shutting off the flow of refrigerant before the plates are thoroughly frosted.

I don't think that your trouble can be due to moisture or to wax in the oil. If it were you would not get a response from the expansion valve upon holding the control bulb in your hand.

* * *

A GRAND total of approximately 750 companies in the food industry now are engaged in processing and freezing foodstuffs in one form or another. In most cases, the larger packers concentrate on freezing fresh vegetables, fruits, meat and fish on a volume basis, but many smaller plants are well into the distribution of frozen specialties ranging from frozen hors d'oeuvres to frozen pie. All these companies employ fast freezing equipment.

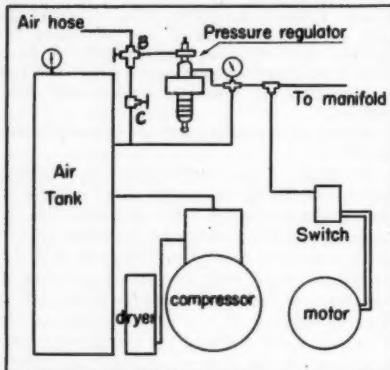


A department for the exchange of ideas on new devices and methods of improving service work. Five dollars is paid for each pointer published. Write up your idea today and mail it to the Service Pointer Editor.

COMPRESSED AIR SYSTEM

A USEFUL piece of equipment in our shop is our air compressor, tank and manifold set-up, and the attachments for the paint gun.

Below the work bench is an old $\frac{1}{2}$ hp. Frigidaire Twin compressor with shut-off valve, the high side piped to the side of a hot water type tank for air storage, and low side piped to a chemical air drier.



Via reducing fittings into top of tank an air pressure gauge is installed in one hole. In the other hole another set of reduction fittings to accommodate an air line pipe. Other pipe openings in the tank are plugged.

The air line from the tank runs to a "T" fitting, one leg of which is fastened into a simple off and on valve (C). From the other end of this valve, connection is made to a two-way shut-off valve (B). From one leg of the two-way-valve, connection is made to exhaust port fitting of air regulator mounted on air filter for spray gun. The other leg of the "T" fitting is piped to intake side of air regulator and filter, through a cross fitting leg, one leg of the cross into the filter, one leg of cross into air pressure gauge, and the other leg into a "T" fitting. One leg of

the "T" fitting is piped to a Penn Heavy Duty air compressor switch, the other runs into a multiple-valved manifold.

Ours has two shut-offs on one end and a manifold shut-off to three more. The two-and three-groups of shut-off valves each have an independent outlet for taking off air-pressure leads for testing.

By having this manifold, we can test any part of any unit at factory test pressures, including the entire system, for leaks and weak spots. And to top it off, you can get a fair efficiency test on a compressor by bucking the air line pressure through the manifold.

Valve (C) shuts off the line to valve (B). In one position, valve (B) allows air through opened valve (C) into hose for blowing dirt, or for air blast through spray nozzle fitting.

By changing valve (B) into other position and closing valve (C), air is drawn through air pressure adjustable regulator and filter, and into the hose line which, by removing nozzle fitting, can be fastened to spray gun.—Submitted by W. C. Hefferlin, Livingston, Mont.

CAPILLARIES VERSUS FLOATS

THE question "Can a high side float be replaced with a capillary tube, or vice versa?" is often asked and while in general the answer is yes, there is one exception.

All units whether of the open, belt driven type or hermetic type equipped with a high side float, can be changed to a capillary tube with success. Open type units equipped with capillary tubes can usually be changed to high side floats, but hermetic units equipped with capillary tubes can seldom be changed to high side floats with success.

The reason is that capillary tubes provide an unloading effect on the compressor by nearly balancing the pressures between the high and low sides of the system during the idle period. This unloading effect provides

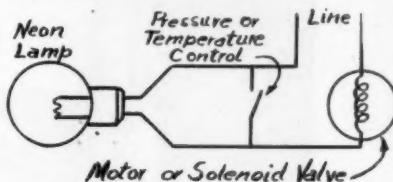
easy starting for the split phase motors used on nearly all small machines in recent years.

Motors on open type units are nearly always sufficiently oversize to start without trouble against a head pressure, but an occasional one may have trouble in starting after the change over. Hermetic motors and compressors are nearly always closely balanced and do not have the excess power to start against a head pressure. If the hermetic unit is equipped with a high side float, the system also incorporates an unloader. If it is equipped with a capillary tube, the unloader is eliminated. Therefore, if the capillary tube is to be replaced with a high side float, some type of unloader must be installed to overcome starting trouble.

INDICATOR LIGHT

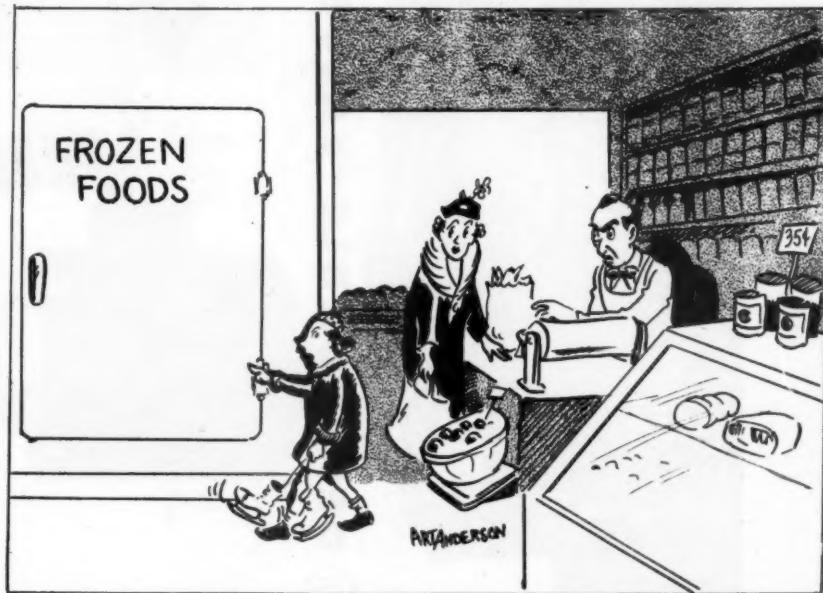
ON NUMEROUS occasions I have connected a socket, with a neon glow lamp inserted, across the terminals of a pressure switch or temperature control. In the open position the current flows through the windings of the solenoid or motor coils and the lamp glows indicating the switch open. When the switch is closed the lamp is by-passed and the current flows directly to the coils.

The current consumption of the neon glow lamp is so little that it cannot harm the windings.

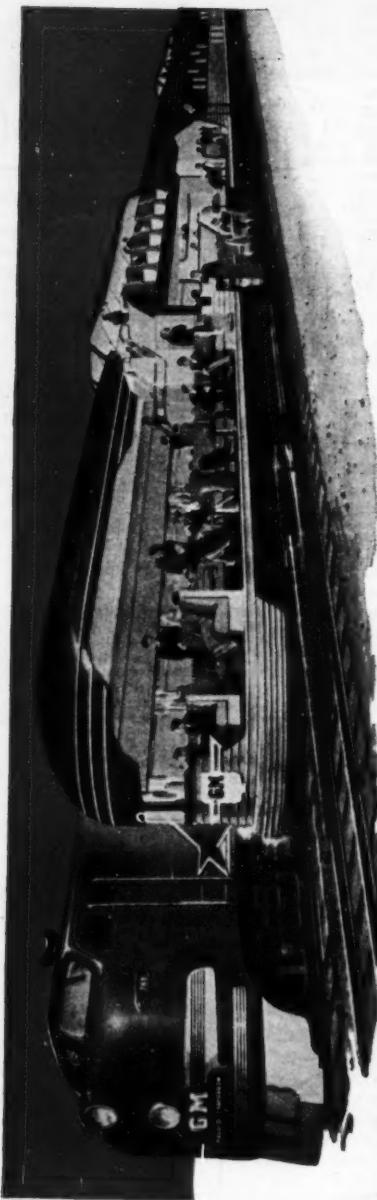


It was found advantageous especially where the equipment was not readily accessible and the operator or serviceman could tell at a glance whether the equipment was calling for refrigeration.—Submitted by H. J. Ferrell, Newark, N. J.

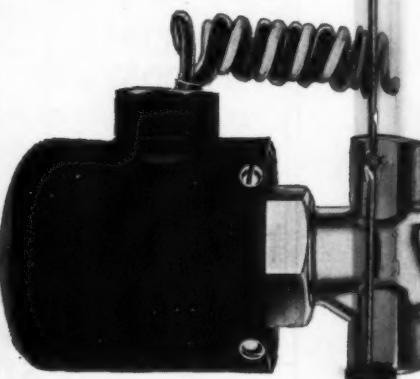
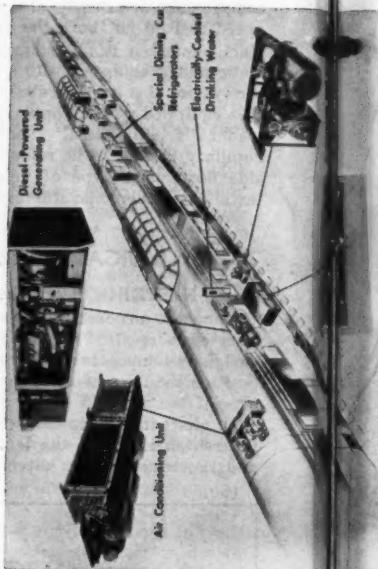
THE demand for large walk-in type refrigerators, most of them with sizeable frozen food compartments, has been forecast at around 25,000 units during the next two years. These installations, which are comparable in design to restaurant and other commercial equipment, are easily installed, some of them in sections, and are adaptable to large families.



"But, mamma, I just want to try out my new skates!"



DEPENDABLE VALVES DO THEIR PART ON



Sectional view of General Motors' Train of Tomorrow, completely equipped with Frigidaire air conditioning and refrigeration.

A-P 7381 Refrigeration Service—
plus Air Conditioning and Refrig-
eration Engineers — are doing their
part on General Motors' Thrilling
Train of Tomorrow.

General Motors' Thrilling TRAIN of TOMORROW

Railroad travelers for years to come will praise the magnificent effort of General Motors Corporation in creating this newest word in traveling comfort and pleasure. For the amazing Train of Tomorrow is smoother-riding, has more restful roomy chairs, the sleeping comfort is increased, you dine in a roof-garden setting and ride in complete air conditioned comfort. All these and more make the Train of Tomorrow a truly remarkable achievement in vacation or business travel . . . a thrill to see today . . . a joy to experience tomorrow.

And A-P Dependable Refrigeration Valves are standard equipment on this fine new train. Just as A-P contributed to human comfort in the first air conditioned streamliners to race over the rails years ago, so A-P Valves again contribute to comfort in the new Train of Tomorrow.



New Air Deck a 32 foot observation deck offers
a "Giraffe's eye view of landscape and skyline."

AUTOMATIC PRODUCTS COMPANY
2454 NORTH THIRTY-SECOND STREET, MILWAUKEE 10, WISCONSIN

Export Dept., 13 East 40th St., New York 16, N.Y.



DEPENDABLE Refrigerant Valves

STOCKED AND SOLD BY GOOD REFRIGERATION WHOLESALERS EVERYWHERE • RECOMMENDED AND INSTALLED BY LEADING REFRIGERATION SERVICE ENGINEERS

Home Freezer Market Needs Spadework

THE home freezer today occupies approximately the same excellent but undeveloped market position as the household refrigerator in 1925, and from a sales and consumer education point of view, it will have to undergo about the same sales pioneering before it can become a major factor in the appliance business.

This observation made recently by R. B. Trick, Kelvinator home freezer sales manager, addressing the Spring conference of the Bureau of Radio and Electric Appliances of San Diego County.

"From a product standpoint, of course, the home freezer is far ahead of the 1925 refrigerator," Trick said. "In 1925, the successful household refrigerator was only about nine years beyond its first installation. Today, the experienced manufacturer of home freezers has more than a quarter century of progress in low temperature cabinets behind him, in addition to years of consumer acceptance of mechanical refrigeration in the home.

"While the product is ready, the market needs a great deal of spadework.

"At the beginning of this year, there were roughly 300,000 home freezers in use nationally—or about one per cent of the wired homes. In addition, there is a close relationship between the potential development of the rapidly growing frozen foods industry and the home freezer business—as the former represents only about three per cent of the nation's fresh food production."

Few People Understand Them

Few people today really know what a home freezer is, what it does, and even those who own them still do not know all the advantages of this newest of home appliances, Trick declared.

"Doesn't this remind you of the situation in 1925 as it pertained to the household mechanical refrigerator?" he asked. "It was virtually an unknown product. Few people knew it—and few salesmen and dealers knew how to sell it. What happened? Manufacturers, distributors and prominent retailers 'discovered' the electric refrigerator for themselves by using it in their own homes. That placed them in a position through actual usage to do a convincing selling job. The next job was to get the story told to thousands of families. The specialty salesman got to work. He told the story of tempera-

ture and food protection and health and convenience. Gradually sales and usage went up, users became salesmen, and the fever began to spread.

"The specialty salesman of 1925, remember, devoted 90 per cent of his sales effort to selling the need and usage of an electric refrigerator and only 10 per cent of his effort to selling a particular brand of refrigerator," Trick continued. "To a great extent, that's the way the home freezer business must be handled today. We must make sure the prospect understands the why and wherefore of the home freezer in general. The manufacturer and the retailer must know the advantages of a home freezer through daily personal use. This will get the 'contagion chain' going, through the retail sales organization, through increasing number of users. No one is in a better position to 'romance' the need of a home freezer than the experienced furniture store salesman with his personal knowledge of prospects."

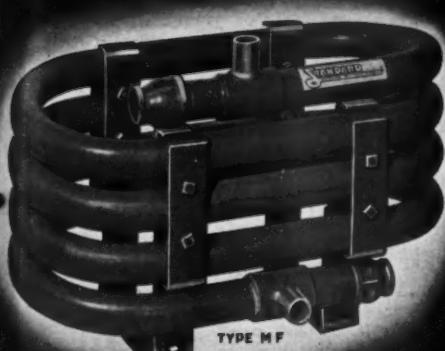
Prospects for Freezers

Trick divided the prospects for home freezers into two principal classes: first, the individual who produces all or part of his own food or who has ready access to fresh farm products; second, the individual who buys all of his food.

"Call these groups what you will, producers and non-producers, or metropolitan or rural, it is essential that we recognize that they are entirely different types of prospects who will require different sales approaches," he said. "Generally speaking, the food producer understands the advantage and economies of the home freezer—certainly more so than his urban counterpart. The locker plants have done an excellent job in rural areas of building this understanding and acceptance.

"This acceptance is now proportionately small in metropolitan areas, although the potential enthusiasm and market there, is of course tremendous. No product can fail to achieve outstanding success when it has behind it the kind of owner enthusiasm which develops out of day-to-day use of a home freezer," he asserted.

"Selling the home freezer via the specialty and educational route may not appear to be the easiest way, but it is the only sound, logical method of putting a firm foundation under this exciting means to a new and better way of living," Trick concluded.



Temp
Multi-Flow

STANDARD

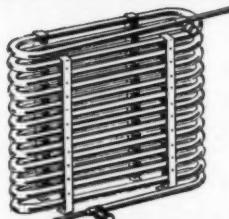
COUNTER-FLOW CONDENSER

SIMPLE—The new Standard multi-counterflow condenser is simple in construction. Water flows through a cluster of $\frac{1}{2}$ " copper tubes incased in steel pipe. The heat transfer tubes are brazed to the steel casing at both the inlet and outlet ends.

CLEANABLE—Continuous sweeping return bends permit cleaning of the water tubes with a regular plumber's clean-out auger.

ECONOMICAL—High heat transfer capacity with a minimum water flow. Low resistance is offered to both the water and refrigerant.

NOW AVAILABLE IN SIZES RANGING FROM $1\frac{1}{2}$ to 25 H.P.



TYPE C SERIES

Standard's well known all copper counterflow condenser meets the requirements for high capacity on $\frac{1}{2}$ to $1\frac{1}{2}$ H.P. units. Compact, light, and fabricated on short radius bends for convenience in mounting and replacement.

WRITE OR ASK YOUR WHOLESALER FOR COMPLETE SPECIFICATIONS

Standard Refrigeration Co.

20 North Wacker Drive

Chicago 6, Illinois

SHIPMENTS OF HOME AND FARM FREEZERS, FOURTH QUARTER 1946 AND SUMMARY FOR 1946

FACTORY shipments of home and farm freezers during the fourth quarter of the year, reached a peak for 1946 of 97,984 units, according to the Bureau of the Census. The value of shipments increased 62 percent,

from \$11.5 million during the third quarter to \$18.6 million during the last quarter of the year.

During this quarter, 42 percent of all freezers shipped were 6 cubic feet and under. Of the 41,381 freezers in the 6 cubic foot and under sizes, 21,724 freezers were between 4.1 and 6 cubic feet; these constituted

Shipments of Home and Farm Freezers, Fourth Quarter 1946 and Summary for 1946
(Includes a small number of combination cooler-freezer units)

Size	Shipments of Complete Units					Purchases of Components				
	Total Number	Total Value (dollars)	Self-contained Unit Number	Remote Unit Number	Value (dollars)	Condensing Unit (number)	Compre- hensor Unit (number)	Force Air Enclosures or Unit (number)	Only Purchase Value (dollars)	Total Purchase Value (dollars)
1946 TOTAL.....	210,248	42,194,304	204,020	39,811,481	6,238	2,382,823	142,471	18,940	507	9,264,134
Under 6 cubic feet ¹	69,179	7,811,202	69,179	5,608,933	0	0	29,983	1,779	12	0
6.1 to 8 cubic feet.....	54,926	5,982,212	54,926	5,982,212	1,553	1126,135	7,847	68	0	1,448,059
8.1 to 12 cubic feet.....	28,318	5,932,820	28,318	5,932,820	2,400	25,063	2,400	0	0	1,535,807
12.1 to 15.9 cubic feet.....	33,223	7,716,634	33,223	7,716,634	3,401	25,719	0	14	1,515,907	1,499,344
16.0 to 20 cubic feet.....	28,446	8,093,416	27,136	7,782	1,310	24,493	1,602	400	27	1,747,304
Over 20 cubic feet.....	15,603	8,395,586	11,238	4,480,680	4,365	1,914,906	14,596	0	0	2,035,025
FIRST QUARTER TOTAL.....	*23,284	*5,333,190	*22,005	*4,985,548	1,189	377,642	*21,176	2,479	27	120
Under 6 cubic feet ¹	*1,808	*226,453	*1,808	*226,453	0	0	*2,268	35	0	0
6.1 to 8 cubic feet.....	4,487	476,068	4,487	476,068	1,062	1,062	2,745	937	0	113,102
8.1 to 12 cubic feet.....	3,487	5,588	3,487	5,588	1,062	1,062	2,745	449	0	140,523
12.1 to 15.9 cubic feet.....	5,789	1,420,950	5,789	1,420,950	1,602	1,602	5,882	1,602	0	1,525,1047
16.0 to 20 cubic feet.....	4,742	1,289,329	4,153	1,163,913	589	135,416	4,188	759	31	235,1013
Over 20 cubic feet.....	2,014	815,683	1,460	584,127	564	23,556	2,350	269	0	303,593
SECOND QUARTER TOTAL.....	*28,992	*6,758,596	*27,401	*6,218,315	1,591	540,381	*25,808	1,844	0	38
Under 6 cubic feet ¹	*3,762	*476,660	*3,762	*476,660	0	0	*3,738	35	0	0
6.1 to 8 cubic feet.....	3,975	6,021	3,975	6,021	1,062	124,721	4,029	1,110	0	150,964
8.1 to 12 cubic feet.....	3,172	5,151	3,172	5,151	1,062	1,062	3,625	1,322	0	22,519
12.1 to 15.9 cubic feet.....	3,982	1,037	3,982	1,037	1,062	1,062	6,125	203	0	180,612
16.0 to 20 cubic feet.....	6,329	1,750,119	5,927	1,657,763	402	92,336	120	244	0	3,363,679
Over 20 cubic feet.....	3,405	1,359,302	2,318	936,078	1,087	423,224	2,513	244	0	336,146
THIRD QUARTER TOTAL.....	*60,038	*11,580,606	*58,378	*10,912,829	1,660	598,077	*41,376	5,047	280	506
Under 6 cubic feet ¹	*22,228	*2,347,653	*22,228	*2,347,653	0	0	*9,850	860	12	0
6.1 to 8 cubic feet.....	14,084	16,064,656	10,324	17,152,222	0	0	*5,908	2,418	68	*342,950
8.1 to 12 cubic feet.....	5,421	*1,643,999	5,875	1,817,172	1,359	973,471	7,299	988	0	477,385
12.1 to 15.9 cubic feet.....	3,381	1,452,298	2,250	1,580,688	1,131	468,246	8,435	430	0	564,482
16.0 to 20 cubic feet.....	1,194	3,295,969	5,216	4,765,303	0	0	*5,038	304	200	*620,857
Over 20 cubic feet.....	6,803	2,765,303	5,210	1,977,423	1,583	790,880	4,846	37	284	389,712
FOURTH QUARTER TOTAL.....	97,934	18,593,912	96,146	17,725,069	1,738	868,823	53,111	9,570	200	711
Under 6 cubic feet ¹	19,657	1,932,129	19,657	1,932,129	0	0	0	2,079	0	0
6.1 to 8 cubic feet.....	21,724	2,627,738	21,724	2,627,738	16,140	2,627,738	0	11,988	849	0
8.1 to 12 cubic feet.....	12,656	45,037,466	12,656	45,037,466	11,088	1,520,533	1,520,533	0	3,362	0
12.1 to 15.9 cubic feet.....	16,052	10,582,277	16,052	10,582,277	1,751	6,647,660	6,647,660	0	821	0
16.0 to 20 cubic feet.....	11,964	3,295,969	5,216	4,765,303	1,583	790,880	4,846	37	2,751	0
Over 20 cubic feet.....	6,803	2,765,303	5,210	1,977,423	1,583	790,880	4,846	37	200	656
									200	1,361

¹ Revised.

Combined to avoid disclosure of operations of individual companies.

Right down the middle!



You'll keep out of the rough if you depend on Kelvinator. For there's a *complete* inventory of refrigeration parts and supplies available at any one of Kelvinator's 50 convenient depots.

Whether you order by phone or mail, or stop in for over-the-counter service, you can be sure of quick delivery on *quality* products. Products that conform to Kelvinator standards of excellence . . . *competitively priced*.

DIVISION OF NASH-KELVINATOR
CORP., DETROIT, MICH.

Kelvinator

CONDENSING UNITS
REFRIGERATION PARTS AND
SUPPLIES



BUY KELVINATOR FOR ALL YOUR REFRIGERATION REQUIREMENTS

22 percent of all freezers shipped during the period.

The value of shipments of all sizes of self-contained freezers increased substantially over the third quarter. These increases ranged from a 110 percent increase in the 16 to 20 cu. foot size (from \$1.6 million in third quarter to \$3.8 million during the fourth quarter) to a 9 percent increase in the 12.1 to 15.9 cubic foot size (from \$2.4 million during third quarter to \$2.6 million during fourth quarter).

This is the third in the series of quarterly reports covering the operations of the home and farm freezer industry. The home and farm freezer statistics in this survey include refrigeration cabinets or chests designed for freezing or storing frozen food, or a combination of both purposes, for use in the home or on the farm. Cabinets shipped without freezer units have been excluded, as well as commercial locker plant equipment and frozen food display and dispensing equipment used for commercial purposes in groceries or confectionery establishments.

The statistics in this report represent virtually complete coverage of the home and farm freezer industry. Although reports were received from approximately 150 companies on Form M52A, Part IV, Home and Farm Freezers, only 100 companies were active during the fourth quarter 1946.

EASTMAN KODAK NEW LOW TEMPERATURE SYSTEM

A MILLION-DOLLAR, 85-below-zero refrigeration system, in some respects believed to be the largest of its kind in the world, is under construction by Eastman Kodak Co. The new system will be used at Kodak Park, the company's largest manufacturing plant and producer of photographic film, paper, plates, and chemicals. Cooling units each capable of turning out 375 tons of refrigeration daily at minus 85 F. will be utilized in the new plant. So far as is known, no machinery of equal size ever has been built before to provide that temperature for big-scale industrial operations, Kodak engineers added.

The brine piping for the system, in addition, is regarded as the most extensive ever planned for refrigeration at 85 degrees below zero. Almost two miles of pipe, 18 inches or less in diameter, will be used. The pipe will be of nickel steel because ordinary steel tubing becomes brittle at the extreme temperatures of this system.

Another record for such a system, it is believed, is the volume of cooling liquid, or "brine," which the plant will contain. This will be approximately 100,000 gallons of methylene chloride, selected because of its very low freezing point. Ordinary brines would freeze at the temperatures to be used.

The new system will bring added efficiency to process condensing operations in connection with the making of photographic materials, the company explained.

Previously, the lowest temperature in the company's refrigeration plant was minus 36 F. That system circulates calcium chloride brine.

The company's cooling plant, in its entirety, is one of the largest in existence and has a total rated capacity of about 19,000 tons of refrigeration per 24 hours, probably enough, it has been estimated, to supply the present refrigeration requirement for all the homes in New York City, or the equivalent of about 1,500,000 mechanical refrigerators.

In the new system, which will be a part of the entire refrigeration plant, two units, each with a 375-ton daily capacity, will be installed this year and other units are planned for the future, the company said.

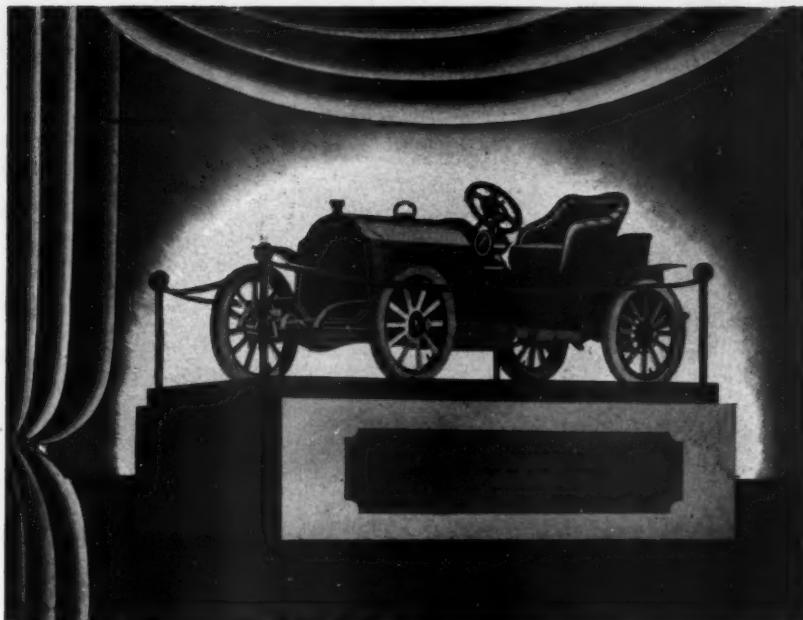
To produce 375 tons of refrigeration at 85 degrees below zero, Kodak engineers noted, as much power is required as would produce 2,500 tons at 40 degrees above zero.

The new units will be powered by two turbines of more than 2,300 total hp. Each of the giant units will circulate about 2,300 gallons of methylene chloride a minute. Standing about 17 ft. high, each machine will occupy a floor space of approximately 22 by 36 ft. and will operate at a vacuum of about 27 inches of mercury.

Kodak Park's refrigeration plant, as a whole, is made up of several different systems operating at various temperature levels. The combined set-up comprises, it is believed, the world's largest of its type, an interconnected refrigeration plant.

Turbines functioning throughout the whole system vary from 800 to 1,400 hp. and motors of 825 to 1,500 hp. also are utilized in running the cooling machinery.

Besides the new, minus 85-degree system, the plant operates others at these levels: a minus 36-degree system circulating 14,000 gallons of calcium chloride a minute; two separate 9-degree systems, each pumping 4,000 to 5,000 gallons of calcium chloride a minute; and four 35 to 40-degree water systems, each running at from 200 to 7,000 gallons a minute.



THIS MUSEUM PIECE IS THE GRANDDADDY OF BUSH FINNED COILS

BUSH

OUR FORTIETH YEAR

Back in 1907, a refrigeration system consisted of a compressor and some iron pipe. It was inefficient, bulky.

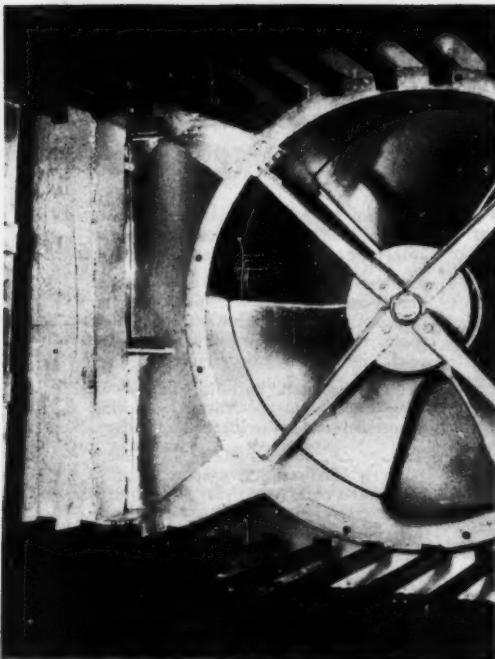
But the 1907 automobiles had efficient finned-coil radiators with power-driven fans. And Bush, who was building these radiators, saw how this idea could be applied to refrigeration.

So Bush began building finned-coil evaporators and condensers, adopting power-driven fans to increase efficiency.

Today . . . 40 years later . . . every modern refrigeration system employs the finned coil. And today Bush builds a substantial part of all low-side commercial refrigeration equipment.

Bush products are sold by leading refrigeration wholesalers everywhere.

**Heat Transfer Products • BUSH MANUFACTURING CO. • Hartford, Conn.
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EXPORT ADDRESS: 13 EAST 40TH ST., NEW YORK, N. Y. - CABLE "ARLAB"**



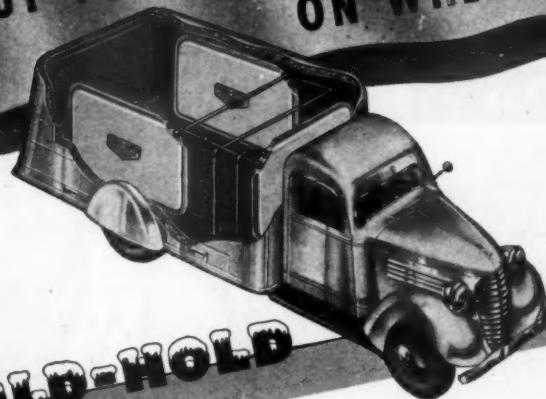
TRAWLER "DEEP SEA" FREEZES AND PACKS FISH AT SEA

THE world's first really fresh seafood delicacy—Alaska King crab, processed quick-frozen, packaged and stored in refrigerated holds within a few hours of leaving cold waters of the Bering Sea—will soon be gracing the tables of America. The vessel designed to achieve this seafood miracle is the 140-foot trawler Deep Sea, pictured above, now on Northern grounds on her first trip. She is expected to return to her home port, Seattle, with a 200,000 pound catch, 95 percent King crab and the remainder sole and lemon sole.

Blast Freezer

Part of the blast freezing equipment used to freeze the product is shown at the left. Intensive research has resulted in a new freezing tray, into which the crab meat is packed. Built to meet the peculiar and exacting conditions of freezing at sea, the tray is so shaped that crab and fish are frozen in molds. Further, it permits freezing under pressure, the consequent exclusion of air reducing the chance of freezer burn or commodity deterioration. Since the

PUT YOUR COOLER ROOM
ON WHEELS



KOLD-HOLD

You maintain 'round the clock refrigeration in your trucks with Kold-Hold Streamlined "Hold-Over" Plates. You are sure of uniform, controlled refrigeration during the day's run.

In addition, the "Hold-Over" Plates protect your undelivered load — you leave it overnight in the truck — find it next morning as fresh, attractive, as it would be in your own cooler room.

Kold-Hold Refrigeration is simple, compact and efficient. Occupying less space inside the truck, it permits greater pay loads and longer runs.

Kold-Hold Engineers can give you modern refrigeration for your old trucks, or provide better refrigeration for your new ones. Ask them for their suggestions.

KOLD-HOLD MANUFACTURING CO.

502 E. HAZEL ST.
LANSING 4, MICHIGAN





Views of the Central Refrigeration Wholesalers Association annual Golf Tournament and Dinner held June 20, at the Acacia Golf Club near Chicago.

Photos by Irving Alter

molds are multiples of the package size, they may be easily cut out to package length, after which the sections are glazed, wrapped in aluminum foil and heat-sealed.

Refrigeration

The quick freezing equipment will handle 1200 lbs. per hour at —25 F. and permits continuous handling of crab and fish in the production line without interruption.

Refrigeration proper is by ammonia, machinery being furnished by Northwest Baker, Inc., Seattle. It consists of two $3\frac{1}{2}'' \times 8\frac{1}{2}''$ 4-cylinder 15 hp. compressors; one $5\frac{1}{2}'' \times 5\frac{1}{2}''$ 2-cylinder 25 hp. compressor; a 16 ft. shell and tube condenser with 2500 ft. of $1\frac{1}{4}$ " galvanized direct expansion coils in the holds and 1170 ft. of finned flooded type coils in the quick freezer with a 36" 15 hp. blast fan in the freezer.

Insulation of holds is 4" cork on all surfaces with plastered and painted surfaces and 8" of cork in the quick freezer; this equipment furnished by Asbestos Supply Co., Tacoma. Two holds, combined 8500 cu. ft. capacity, are held at zero F. or less.

WHOLESALERS HOLD SECOND ANNUAL GOLF TOURNAMENT

THE Central Refrigeration Wholesalers Association held their second annual golf tournament and dinner at the Acacia Country Club on Friday, June 20th. Over 75 registered for the affair and many participated in the tournament. Early morning players included Pat Ravanesi, Service Parts Company, Entertainment Chairman and Secretary of the Association.

Representatives from all the central group were in attendance, as well as a large number of manufacturers. When dinner was announced and all were seated, a few golf scores were still to be entered. While Pat Ravanesi was checking the final results, Leo Keely, Airo Supply Co., entertained the group as only Leo can with a few remarks.

Upon completing an excellent dinner, door and tournament prizes, piled high behind the speakers' table, were distributed. The prizes included radios, electric shaver, golf bag, fly rod, poker table, and many other valuable items. Winner of the door prize was J. Barnett, Jas. P. Marsh Gauge Company. First prize in golf went to Lee Darter of Airo



"MAKE MINE THE GAUGE WITH THE RECALIBRATOR" . . .

That's the final verdict of refrigeration men who know their gauges and dial thermometers. They look upon the Marsh "Recalibrator" as a feature that makes a better instrument still better.

There is a good, solid reason for this: Every refrigeration man knows how difficult it is to avoid knocking gauges out of adjustment, particularly test gauges that receive rough handling in the tool kit and on the job. But when this happens to a Marsh gauge, you simply turn the "Recalibrator" screw as illustrated until the pointer coincides with zero. This, remember, is not merely re-setting of the pointer, for the "Recalibrator" is designed to actually re-establish the relationship between the bourdon tube and the movement. Thus it corrects the gauge at all points on the dial—the only basically sound way to do it.

Yes, it's reassuring to use these instruments that are so easy to keep on the beam. All are available with the "Recalibrator". Ask for handy booklet covering gauges and thermometers for refrigeration service.

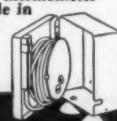
JAS. P. MARSH CORP., 2057 Southport Ave., Chicago 14, Ill.
Export Department: 155 East 44th St., New York 17, N. Y.



Marsh Refrigeration Gauge
—made in pressure, com-
pound, and ammonia types.



Marsh Serviceman—remote
reading service thermometer
—now available in
range —30° F.
to +65° F. for
work on quick-
freeze units.



MARSH *Refrigeration
Instruments*

Supply Co., and second prizes were awarded L. C. McKesson, Ansul Chemical Co., and Pat Ravanesi.

Credit for the success of the affair goes to the entire membership of the Central Refrigeration Wholesalers Association, and particularly to Irving Alter, Harry Alter Co., for the pictures, and the manufacturers who so thoroughly entered into the spirit of the occasion.

REWA AND REMA BOARDS HOLD JOINT MEETING

IN A recent joint meeting of the Board of REWA and REMA, the members of the REMA Board of Directors expressed the strong desire to assist wholesalers in overcoming their problems resulting from unbalanced inventories. No definite program was worked out to meet these difficulties but several suggestions were made. Among them was the suggestion that sales representatives calling on wholesalers would assist in working out stock surplus inventories.

REMA also expressed the desire to use the industry public relations program as a means of helping the wholesalers' activities. REWA decided that their slogan "Buy from Your Wholesaler" should be promoted to greater use. It was suggested that stickers be prepared and lots of 500 sent to each member for use on letters, invoices, etc. Cuts would also be available for those wishing to imprint on their stationery. REMA members are to be urged in using the slogan on their industry advertising.

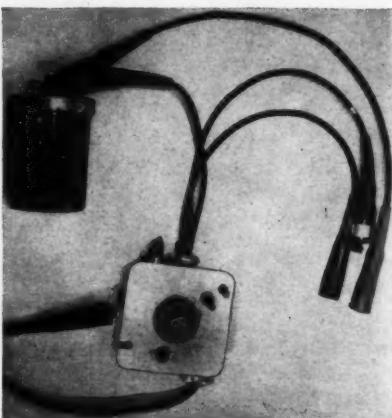
The REMA Board recommended to the REWA Board that consideration be given to holding the 6th All-Industry Exhibition at Atlantic City, N.J. in 1950.

LOCKER PLANT CONSTRUCTION

ABULLETIN titled, "Basic Recommendations for Freezer-Locker Plant Construction," prepared by M. B. Matlack has been issued by the U. S. Department of Agriculture. It is offered as a guide to those who contemplate the building of a locker plant and to help them avoid possible costly mistakes. When general plans have been made, it is suggested they should be presented to a competent freezer locker architect and refrigeration engineer whose advice should be followed for carrying out the construction and equipment installation.

The bulletin discusses briefly the general space requirements and related needs and construction of a freezer locker plant.

SEALED UNIT TESTING AND STARTING DEVICE



Part of the sealed unit testing and starting device with its three leads for connecting to the terminals of the hermetic motor.

HERE is a new sealed unit starter and testing device designed by Joe W. Langford, Waco, Tex., who has used it with success for the past year and a half. Although the complete unit starter is not shown in the picture, this device, according to Mr. Langford, is simple in construction and operation and does not require an electronic engineer to understand and operate it.

The instrument, intended primarily as a test device for hermetic units, also incorporates a unit starter. By connecting to the three external terminals of the hermetic motor and by flipping a switch back and forth on the starting and testing instrument, the hermetic compressor can be rocked back and forth to break it loose. Compressors, stuck due to unusual conditions such as extended heavy loads, dirty condensers, etc., may often be put into operation without removal to the repair shop.

The method may be employed on either reciprocating or rotary type compressors and the windings of the motor are subjected to no higher voltages than they are designed for.

The instrument can be used for all other electrical testing in the hermetic unit, such as testing relays, thermostats, circuits, motor windings and capacitors.

TEST

*... for volts, amperes, or watts with
this one small, compact instrument*

Here is the first appliance tester ever made that gives you volt, ampere, and wattage readings all from one small, compact instrument.

Model 390 slips easily into a large pocket, weighs only a pound and a half, is designed for hard, continuous service.

The range of uses for this volt-amp-wattmeter is almost unlimited in checking line voltage, current drain and power consumption, the three simple tests which will diagnose most cases of electrical trouble. In fact, practically any household electrical appliance that has a motor or a heating element, can be tested by the 390, as well as certain industrial installations.

You merely plug Model 390 and appliance to be tested into the Break-In plug furnished—voltage will read. To read watts or amperes, simply press one of the two buttons at bottom of the panel.

Aside from its unique features, Model 390 has no equal among appliance testers in quality alone. The famous Simpson quality makes investment in the Model 390 an investment that will return a rich yield in satisfactory service through the years.

USE MODEL 390 FOR TESTING

Refrigerators	Motors
Deep Freezers	Electric Heaters
Washing Machines	Radio Sets
Irons	Lamps
Toasters	Vacuum Cleaners
and all similar appliances	

Ranges—A.C. Current, 60 cycles

Volts: 0-150, 0-300.

Ampères: 0-3, 0-15.

Watts: 0-300, 0-600, 0-1500, 0-3000.

Size: 3" x 5 1/8" x 2 1/2". Weight 1 1/2 lbs.

Shipping weight 3 lbs.

Price, with Break-In plug
and leads \$39.50

Leatherette carrying case,

with leads compartment..... 4.00

Genuine leather carrying case,
with leads compartment..... 8.00



Simpson Model 390
Volt-Amp-Wattmeter

SIMPSON
SIMPSON ELECTRIC COMPANY
5200-5218 W. Kinzie St., Chicago 44, Ill.
In Canada Bach-Simpson, Ltd., London, Ont.
INSTRUMENTS THAT STAY ACCURATE

N.A.R.C. SURVEYS SAFETY CODES OF LARGE AND SMALL CITIES

MOST cities of the United States have no refrigeration safety code; and most of the codes in existence are antiquated, according to a survey made by the National Association of Refrigeration Contractors.

NARC was endeavoring to find out two things; first, information about safety codes, and second, to what extent licensing of refrigeration contractors is required.

A letter, and later a follow-up letter, were sent to 182 city clerks; 115, or 87% replied. That, in any direct-mail expert's opinion, is a remarkable return.

Ninety-two of the cities had populations from 100,000 up. Replies were received from 79 of these (86%).

Forty cities had populations from 35,000 to 100,000; and replies were received from 36 of these (90%).

Of the 79 larger cities, 29 or 37% have some kind of a refrigeration safety code. It is reasonable to assume that the cities not replying have no codes, so it is reasonably safe to say that two-thirds of the large cities of our country do not have a refrigeration safety code.

Of the 36 smaller cities from which replies were received, 4 or 11% have codes. This leads to the logical and safe assumption that 90% of the smaller cities do not have safety codes.

Economic conditions are fast bringing back a buyers' market with keener competition. With no safety standards, temptation can easily enter to skimp a job, or take what might be considered a small chance. Every industry has its men willing to work on the fringe of safety. This situation is now accentuated by the thousands of men being turned out of training schools.

Obviously, a safety code is an all-industry matter. NARC is only one branch of the industry, so all it can do is point out some of the facts found in this survey.

NARC's check showed that a few cities are using the B-9 code; a few others, a modification of it. St. Louis, for example, has a very much abbreviated and modified B-9 code, dated March 6, 1945.

Indiana has a state code which is a slight modification of the 1939 B-9 code. It was approved and promulgated May 26, 1944, and approved and adopted by the Indiana State Board of Health August 27, 1944.

NARC found that the best codes received were those of Oklahoma City; Long Beach,

California; and Detroit and Grand Rapids, Michigan. All are more recent, include licensing provisions.

Ohio Group Studies Code

A one-day conference to launch a move for an Ohio state refrigeration code was held recently in Columbus by a group of Ohio Refrigeration contractors representing the presidents of local associations affiliated with the National Association of Refrigeration Contractors, and a representative of other cities having NARC members.

The opinion was unanimous to work out a safety code with licensing, permits, inspections and bonding of contractors; also licensing be confined to contractors. George Schuld agreed to be chairman of a committee to work this out.

When the code is worked out, efforts will be made to get it adopted in Ohio cities; then, with this uniformity, action can follow to get it adopted as a state code.

Checks in the state have revealed many instances of unsafe installations and much work done by unqualified men, hence the urge to stop this as much as possible and protect the users of refrigeration equipment and the public by means of a good code.

* * *

GUILD ELECTS NEW OFFICERS

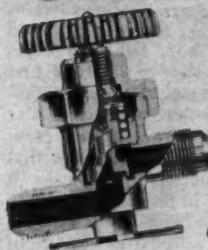
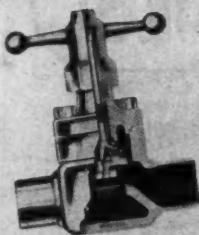
THE Refrigeration & Air Conditioning Guild, Inc., an organization of refrigeration contractors in the Metropolitan New York Area, held its annual meeting at the Hotel Pennsylvania on May 21, at which time the election of officers took place.

The following were elected as officers of the Guild for the ensuing year. For President, Robert A. E. Towse; for Vice-president, Nathan Edelstein; for Secretary, Bela Spitz; for Treasurer, Theodore Schwartz; Sgt.-At-Arms, James H. White; Regional Vice-President in Brooklyn, Joseph Ulrich; in Manhattan, Leo Marks; in Queens, Sam Kesselman; and in the Bronx, Harry Zysman; Board of Directors, Herman Nielsen, Charles Navlen, Max Sussman, George Wells, Herman Tirico, Joseph Lipack and Jacob Achs.

The installation of the officers was held at the annual dinner-dance at the Hotel New Yorker on Saturday evening, May 24.

The Refrigeration & Air Conditioning Guild, Inc., is associated with the National Association of Refrigeration Contractors and is one of its charter members.

Special Ability AT YOUR COMMAND



KEROTEST MANUFACTURING CO.
PITTSBURGH, PA.

ALL these—up-to-date technical knowledge, familiarity with problems, trained personnel, stocks of Kerotest Valves and the "Know-How" to find solutions—make Kerotest Wholesaler's service and speed delivery—all the abilities of your Kerotest Wholesaler are at your command. Depend on Kerotest Wholesaler for your Kerotest Air Conditioning and Refrigeration needs.

See your



Wholesaler

AMERICA'S FIRST NAME IN QUALITY

GUIDE POST to dependable quality!

"See Your Kerotest Wholesaler" is more than a slogan . . . it is your guide to dependable service on the finest line of air conditioning and refrigeration valves, fittings and equipment in the industry.

Kerotest Wholesalers were selected as distributors of Kerotest Valves and Fittings because they have proven themselves to be capable business-

men who are equipped to give you the best in technical assistance, helpful information on new developments, and to serve as your supply source for the *best* of every type of part and equipment. Depend on your Kerotest Wholesaler. He carries your inventory for you . . . stands behind its quality . . . knows where to locate the hard-to-get items.

See your



Wholesaler

KEROTEST MANUFACTURING CO.
PITTSBURGH, PA.



NEWS and ACTIVITIES

Announcements of the activities and educational work of the International Society and Local Chapters appear in this department.

COMING CONVENTIONS

Alabama Association

Place: Admiral Semmes Hotel
City: Mobile, Alabama
Date: October 17, 18
Chairman: T. O. Cooper, Harris Supply Co., Mobile, Ala.

National Locker Convention

Place: Municipal Auditorium
City: Kansas City, Mo.
Date: September 25, 26
Director: R. R. Farquhar, 656 Insurance Bldg., Omaha, Neb.

Illinois State Meeting

Place: Baker Hotel
City: St. Charles, Ill.
Date: November 1, 2
Secretary: R. E. Saunders, 730 Townanda Ave., Bloomington, Ill.

RSES Annual Convention

Place: Hollenden Hotel
City: Cleveland, Ohio
Date: Jan. 21, 22, 23, 24, 1948
Secretary: H. T. McDermott, 433 N. Waller Ave., Chicago 44, Ill.

R.E.M.A.—All-Industry Exposition

Place: Cleveland Public Auditorium
City: Cleveland, Ohio
Date: January 26-29, incl., 1948
Secretary: R. Kennedy Hanson, 1107 Clark Bldg., Pittsburgh, Pennsylvania

IOWA STATE BOARD MEETING

A MEETING of the Board of Directors, Iowa State Association, was held June 1st at the President Hotel in Waterloo, Iowa. Despite inclement weather, attendance was good, with the Dubuque, Cedar Rapids, Davenport and Waterloo Chapters represented. All officers of the Association were in attendance with the exception of Mr. Brewster of Des Moines. Luncheon was served in the Zephyr Room after which the members retired to a meeting room where

the meeting was called to order by the President, Erv Meyer. A discussion of dues collection, annual convention and chapter programs was held. In the interest of the matter, it was decided to arrange meetings of the four chapters so that they would be held on consecutive nights in the following order: Davenport—first Tuesday after the first Monday of the month; Dubuque—first Wednesday after the first Monday; Cedar Rapids—first Thursday after the first Monday; Waterloo—first Friday after the first Monday. This arrangement will make it possible for a speaker to cover all four chapters in succession at a minimum of expense. Waterloo, Iowa, was selected as the site of the annual convention to be held in the spring of 1948.

* * *

UTAH AGGIE MEMBERS GRADUATE

THREE junior members of the Utah Aggie Chapter were graduated with two-year terminal certificates from Utah State Agricultural College on June 7. These students were the first men to be graduated from the College in air conditioning and refrigeration. They are Ira Allen, Roscoe Black, and Roy D. Larsen. All are now employed in the refrigeration industry.

The air conditioning and refrigeration subjects have become so popular at this school that a department has been set up with Prof. J. Cecil Sharp at the head. Douglas Mander of the Beehive Chapter has been assisting since the first of January. Beginning July 1st, another instructor is being added to the staff in order to take care of the large enrollment of students interested in this work.

* * *

TRI COUNTY CHAPTER HOLDS 10TH BIRTHDAY PARTY

ONE of the finest dinner parties ever sponsored by the Tri County Chapter was held at the Baker Memorial Building in St. Charles on June 21st. This party was in

SOUTH BEND LATHES

CUT COSTS

South Bend Lathes turn out service work in less time and at lower cost.

They are indispensable for reconditioning operations on a wide variety of refrigeration equipment. You keep the work in your own shop—save machining charges—and speed-up your service.

South Bend Lathes are fast, easy to operate, exceedingly accurate, and efficient. If you are interested in cutting costs and doing better service work, see local distributor for complete information on South Bend Lathes. Write for his name, today!

PROMPT DELIVERY from distributor's stock or direct from factory.

PRICES start at \$145.00, f.o.b. factory. Average increase less than 15% over prewar price level—product quality greatly improved.

TIME PAYMENT terms on purchase of lathe, tools, attachments—25% down, 12 months to pay balance. Moderate finance charge.



WRITE FOR CATALOG. South Bend Lathes made in Toolroom and Quick Change Gear models with 9", 10", 13", 14½" and 16" swings. Also tools and lathe attachments.



BUILDING
BETTER LATHES
SINCE 1906



SOUTH BEND LATHE WORKS
529 EAST MADISON STREET, SOUTH BEND 22, INDIANA



Views of the Tri-County chapter birthday dinner held in honor of past presidents. Bert Clark, secretary, is shown in the inset, cutting the cake.

honor of the nine past presidents and the present president of the chapter. The entertainment committee consisting of Clem Burg, Harold Ellis, Bert Clark, Russ Hagemann and William McCarley, planned the affair far enough in advance to give the past presidents, who no longer reside in the area, an opportunity to attend.

Over 75 members and guests enjoyed a fine dinner accompanied by the singing of the Esquire Quartet, members of the Society for Preservation and Encouragement of Barber Shop Quartet Singing in America, Inc. At the speakers' table were seated the following past presidents: Harve Burgess—1937, William Metcalf—1939, Willis Stafford—1940, Harold Anderson—1941, Bert Clark—1942, Norbert Rust—1943, Fred Johansen—1944, Dick Marquis—1945, and Harry Spring—1946. Others at the speakers' table were John Sackey, President, Floyd Lilley, 1st Vice-President, William McCarley, 2nd Vice-President of the Illinois Association, and Ralph May, Tri County Chapter President for 1947. Gene White, president in 1938 and now residing in Minneapolis, was unable to attend and sent the Secretary, Bert Clark, his regrets.

A large birthday cake was centered on the

speakers' table and just before dessert was served, Bert Clark, Chapter Secretary, was honored by cutting the first piece while the S.F.P.A.E.B.S.Q.S.I.A. quartet sang Happy Birthday.

Introduction of the past and present officers was made by the Master of Ceremonies, Willis Stafford of Herman Goldberg Company. Following a short talk by each of the past presidents, a film was presented showing several R.S.E.S. gatherings at picnics and conventions, taken by Herman Goldberg. Herman went into his motion picture file to assemble a very interesting reel of 400 feet.

Chicago Chapter was well represented by several of the officers and members.

Chapter Notes

- ARROWHEAD CHAPTER, *Riverside, Cal.*, June 9—Herb Kaeding presided in the absence of President Zimmer who, because of the illness of his wife, could not be in attendance. Business for the evening was postponed in favor of the educational program arranged by Mr. Ricker, Educational Director. Mr. Ricker introduced Mr. Lutz of Los Angeles, who gave an interesting demonstration and talk on the repairing of Coldspot refrigerators. Following this talk, the regular order of business was resumed. The first

Boost your

June-July-August...



Profits...

with the NEW **TEMPIRE**
Draught Beer Coolers

COOL DRAUGHT BEER flows freely in hot June-July-August weather and cooling equipment *must* be right to properly carry these greater loads. Now is the time to replace outmoded, defective equipment with the new Temprite Draught Beer Coolers.

So, put on your coolest working clothes and go to it, men! Introduce this great new Temprite in every tavern, club and bar in your territory.

Tell your customers about Temprite's ability to handle hot weather loads to perfection . . . with every glass *perfectly cooled, every glass perfectly clear!*

Tell them about Temprite's new all stainless steel coils that eliminate metal contamination, and deliver top-flavor beer!

Compact, highly efficient Temprite coolers provide trouble-free operation and greatly reduce service costs. Don't let your summer-profit months slip away. *Wire Now!*

IN CANADA: Refrigeration Supplies Company, Ltd., 1127 Dundas Street, London, Ontario



COOLERS
IN STOCK
AT ALL LEADING
WHOLESAVERS

TEMPIRE PRODUCTS CORP.

Originators of Instantaneous

80° 40°

Liquid Cooling Devices

45 PIQUETTE AVENUE

DETROIT 2, MICHIGAN



Seated at the speakers' table during the Border Cities Chapter charter night dinner, shown in the upper picture, left to right are: Bud Houston, 2nd Vice-president; Ted Jolliffe, 1st Vice-president; George F. Taubeneck, guest speaker, editor and publisher ACRN; Dewey Hamilton, President; W. A. Marshall, International 1st Vice-president; H. T. McDermott, International Secretary; E. G. McCracken, W. M. Maybee, Secretary.

Officers and directors of the Border Cities Chapter are pictured below. Left to right they are: Van Waffle, Educational Chairman; Nels Johnson, Treasurer; Ted Jolliffe, 1st Vice-president; Dewey Hamilton, President; Bud Houston, 2nd Vice-president; W. M. Maybee, Secretary; Dave Smiley, Sergeant-at-Arms. Standing, left to right: Lorne Kettlewell, Director; Ab Wilson, Director; Erie McDonell, Director; Tom Seville, Chairman of Board of Directors; Everett Arrand, Director; Rae Miller, Director; and Dick Bannister, Director.

Item of new business was the election of new officers. They are: Herb Kaeding, President; Ed. Warner, 1st Vice-President; C. Edwards, 2nd Vice-President; P. B. Montgomery, Secretary; E. L. Gilmore, Treasurer; D. W. Crawford, Sergeant-at-Arms; and C. H. Ricker, Educational Director. Board of Directors—F. A. Frazier, F. W. McCulley, W. H. Bird, D. M. DeWeese and V. A. Kerr. Upon installation of these new officers, J. Pat Riley gave a short talk on the responsibilities of officers of the chapter.

● **BIRMINGHAM CHAPTER, Birmingham, Ala., June 4**—New officers of the chapter were installed to office during this meeting. They are: Jas. A. Foley, President; W. V. Peek, Vice-President; E. L. Merrill, Secretary; and W. C. Kent, Treasurer.

● **BORDER CITIES CHAPTER, Ontario, Canada, June 3**—This was the night of the charter meeting, held at the Elmwood Hotel. Chairman Dewey Hamilton offered a toast to the King and the President of the United

States. At the conclusion of dinner, the Sergeant-at-Arms called the roll and all officers of the chapter responded. There were 63 members and guests present. Guests at the speaker's table were Bud Houston, 2nd Vice-President; Ted Jolliffe, 1st Vice-President; Geo. F. Taubeneck, Guest Speaker; Bill Marshall, International 1st Vice-President; H. T. McDermott, International Secretary; E. G. McCracken, Secretary of the I.P.A.; and Wilf Maybee, Chapter Secretary. Ted Jolliffe introduced the speakers.

Mr. Taubeneck gave a very timely address on the present and future of the refrigeration industry. Interspersed with humor, he divulged to those present an entirely new conception of disease and its possible control through refrigeration. Those present left with the feeling that they were associated with an industry of tremendous magnitude. The Chairman thanked the speaker and then asked the Secretary to read the minutes of the last meeting. The Chairman then called on Bill Marshall for a few words. He wished the chapter every success. Mr. McCracken was then called on. He gave a quick picture of the I.P.A. setup and emphasized how the membership was spreading. He also referred to the excellent correspondence course being sent to all members. His comments on the speaker's remarks were most appropriate.

The presentation of the charter by Mr. McDermott then took place. It was a most impressive ceremony and on closing Mr. McDermott placed emphasis on what the Border Cities Chapter could contribute to the industry. Appropriate remarks were then given by the following guests: Earl Jennings of Temprite Corp., Paul Domke of Mueller Brass Co., Dale Mericle of Business News Publishing Co., Alex Dawson of Refrigeration Supplies Co. Ltd., Len Sanborn of Weatherhead Co., and Ford Murphy of Sangamo Electric Co.

● **CENTRAL ARIZONA CHAPTER, Phoenix, Ariz., May 13**—President Tally presided over this meeting held at Pepsi Cola Hall, Phoenix, Ariz. The guest of honor was International President W. W. Allison. The regular routine of business was suspended and President Allison invited to address the meeting. Mr. Allison complimented the chapter on its growth since he visited it in February. He spoke on the planned educational program of the National Society, stating that it is expected funds will be raised within the next year to defray the expenses. He suggested the chapter hold a certificate examination, pointing out the prestige gained by the chapter in having as many certificate members as possible. During the course of the business session that followed, Alfred M. Mathias was appointed Assistant Secretary.

● **CENTRAL CONNECTICUT CHAPTER, Hartford, Conn., May 26**—The educational program included a quiz contest. The teams were picked, headed by D. Morrell and T. Dvobowski. The quiz was very interesting all the way through, and ended in a close contest. Educational films were shown later in the evening.

● **CHICAGO CHAPTER, Chicago, Ill., June 10**—A good deal of planning was done on the

The REFRIGERATION SERVICE ENGINEERS REFERENCE MANUALS

REFRIGERATION Service Pointers



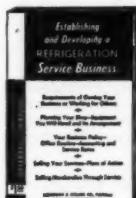
How many times have you wanted an idea that you could use—to test equipment—something you could build in your own shop; or special shop equipment that would expedite your overhauling and rebuilding work; or special tools to save you time. Here for the first time in handy book form, is a collection of over 230 practical, workable refrigeration service pointers.

The "pointers" represent the combined practical experience of hundreds of servicemen—men who "know how" and who have worked out their problems in a practical "down-to-earth" manner. The only book of its kind.

\$1.50

6" x 9"
128 pages

Establishing and Developing a REFRIGERATION Service Business



Whether you are starting a service business—or expanding your present refrigeration business—you need this new book because it provides factual information, based on actual experiences of those who have worked out successful plans in developing their own businesses.

There are numerous conditions to take into consideration when you start your own business or plan on expanding your present business. It is the purpose of this book to guide you in formulating a constructive program.

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6" x 9"
106 pages

Servicing HERMETICALLY SEALED UNITS



Servicing Hermetics is published in answer to many requests from the field and is intended to provide a description of the operation, construction and field service on hermetically sealed units. While the book does not serve as a shop manual or provide specific instructions on rebuilding, it brings you the most complete "trouble-shooting" information on hermetics.

More and more of your domestic calls will be on hermetics. With this book you will have refrigerant and oil data and wiring diagrams on the principal hermetics now in operation.

\$3.00

6" x 8 1/2"
296 pages

Nickerson & Collins Co.
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Date

Enclosed is remittance for \$..... Send the following as checked below:

- Servicing Hermetically Sealed Units. Refrigeration Service Pointers.
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PLEASE PRINT

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CITY ZONE STATE



Officers and members of the Greenville chapter posed for the above picture during the charter presentation meeting held May 16.

forthcoming picnic to be held on Sunday, August 24, at Figuras picnic grove, Garden Lane Road $\frac{1}{2}$ mile east of Manheim Road. The picnic committees include Al Delheim and Marty Brunderman in charge of prizes, Irving Alter on publicity, John Heger and Ed Riccio in charge of refreshments, Lou Norris and Joe Dedich who will form the police committee and control parking, John Habich, Frank Fraze, Ed Tabor, Ray Frame and Dwight Orr who will take care of the entertainment. A baseball game between the north and south sides of Chicago is being planned for the picnic, with Marty Brunderman being elected captain of the north side team and Floyd Lilley captain of the south side. Umpire will be picked by the jobbers. The educational program of the evening was provided by Mr. Nagler of Coldaire Corporation, who gave a talk on frozen foods, which was thoroughly enjoyed by his entire audience. The door prize provided by Secretary Al Delheim was won by Irving B. Anderson.

• DIRIGO CHAPTER, Lewiston, Me., June 10—Seven new members were accepted to membership during this meeting and on the educational program Ray Burke, Imperial Brass Co., conducted a tube bending contest. He was assisted by Clayton E. Canning, who supervised the contest, and Robert LaBourdais, Charles Wyman and Russell Dow who acted as judges. The timer was Robert Thurston. Winners of the contest were: 1st prize, Edward Boudway; 2nd prize, Charles Redmond; and 3rd prize, Clarence Ingham. Tube bending and flare tube kits were awarded the winners by Mr. Burke.

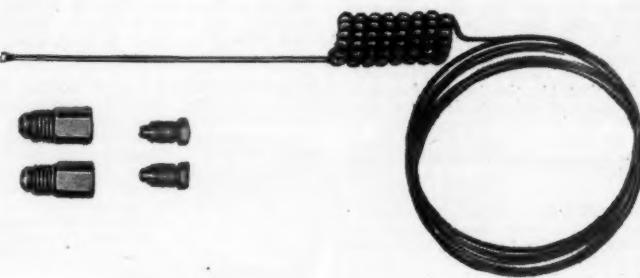
• ELM CITY CHAPTER, New Haven, Conn., June 6—About 40 members were present for the annual election of officers. The new officers elected are: William Paine, President; Thomas Howell, 1st Vice-President; W. Pazik, 2nd Vice-President; Walter Woods, Treasurer; Les Harris, Secretary; Joseph Gencarz, Sergeant-at-Arms; and Ralph Rice, Educational Chairman. Four new members were accepted to membership during the meeting, bringing the membership to a grand total of 86.

• FAIRFIELD COUNTY CHAPTER, Fairfield County, Conn., June 9—It was decided at this meeting to hold a picnic at Sherwood Island State Park for members and their families on August 10. Committees were appointed to arrange the details.

• FRESNO CHAPTER, Fresno, Calif., May 8—The annual election of officers resulted in the following: George E. Messick, President; John Gerlinger, Vice-President; Paul Shirk, Secretary; Don Wright, Treasurer; John Rowden, Educational Chairman; Howard Hughes, Sergeant-at-Arms.

• GOLDEN GATE CHAPTER, San Francisco, Calif., May 26—The meeting was held at the Druids Temple. A. Baker, Asst. Sales Manager for Alco Valve Co., gave a most interesting and comprehensive talk on Alco valves, which was illustrated by numerous slides. A highlight of the evening was the demonstration of a refrigeration unit equipped with a glass evaporator, which drew much attention. T. Davenport, Field Engineer for Pacific Scientific Co. of San Francisco, was present and aided Mr. Baker in answering the many questions on refrigeration problems from the audience of over 140 men. The meeting was sponsored by Pacific Metals Co. Ltd. of San Francisco, and was represented by B. E. Watters, Manager of the Refrigeration and Air Conditioning Dept., LaMonte E. Foster, Refrigeration Engineer and members of Refrigeration Sales. The evening was concluded at about 10:00 P.M. after which a mad rush was made for the Coca Cola, beer and sandwiches.

• GREENVILLE CHAPTER, Greenville, S.C., May 16—The purpose of this meeting was to receive the charter and therefore all other business was discussed at the latter part of the meeting. Mr. Carnell read the objects of the Society and the by-laws and presented the charter. Mr. Carnell was accompanied by Henry Gallat, salesman for Ansul Chemical Co., who aided in the formation of the chapter. After the charter was presented the members voted that the temporary officers be elected for a term of one year and they



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were duly sworn in. The officers for the year are as follows: W. C. Lindley, *President*; V. W. Swan, *Vice-President*; W. E. Williams, *2nd Vice-President*; W. N. King, *Secretary and Treasurer*; P. C. Scroggs, *Sergeant-at-Arms*. Discussion on approval methods for new members, newspaper ads, phone ads and city codes was held. After this, another discussion was held on the printing of price catalogs, voting of junior members and when the meetings of each month were to be held. It was decided that (1) the junior members would not be allowed to vote, (2) any purchase made by the Treasurer would have to be approved by the President, (3) the meetings would be held on the second Wednesday of each month.

● **HEAD OF THE LAKE CHAPTER, Duluth, Minn., May 5**—Two new applications for membership were received and it was decided that students should be invited to attend meetings of the chapter. On the educational program, Joe Page of Detroit Lubricator Co. gave an instructive lecture on construction, operation and servicing of thermostatic valves.

● **HOUSTON CHAPTER, Houston, Tex., June 10**—A. A. Haney, Chairman of the Educational Committee, read questions from the question box, most of which pertained to moisture—the number one hazard in a refrigeration system. A general discussion on different drying agents, with members joining in to express their experiences, made this a very interesting session. A request was made to Mr. Haney by the members to furnish information on two and three stage refrigeration systems during a forthcoming educational program.

● **INDIANAPOLIS CHAPTER, Indianapolis, Ind., Apr. 8**—During the business session of the evening a bulletin was read outlining instructions on the parking of service cars and trucks in restricted areas. A letter from the National Office on educational material of the future was discussed by the members and the ten most popular suggestions selected. Educational films supplied by the National Society were shown on the educational program.

● **JOPLIN CHAPTER, Joplin, Mo., June 11**—Thirty members were in attendance at this meeting and the main part of the business was taken up with the annual election of officers. The new officers are: Norman Burke, *President*; James Morgan, *1st Vice-President*; W. J. Bicknell, *2nd Vice-President*; L. E. Hadley, *Treasurer*; Douglas D. Fuller, *Secretary*; and George I. Buxton, *Sergeant-at-Arms*.

● **KEY CITY CHAPTER, Dubuque, Iowa, June 4**—The entire business session was taken up with the annual election of officers, resulting in the following: O. E. Knopp, *President*; Curtis Breed, *Vice-President*; John J. Relchel, *Secretary and Treasurer*; Wilfred Nestor, *Asst. Secretary and Treasurer*; Robert S. Pier, *Sergeant-at-Arms*; Clarence J. Brashaw, *Educational Chairman*; Stan Jones, *Entertainment Chairman*. Plans for the annual picnic to be held July 30 were discussed.

● **LA CROSSE CHAPTER, La Crosse, Wis., Apr. 25**—After a short business meeting, Messrs. D. O. Eggert and Frank Tanley, of White-Rodgers Electric Co., were introduced by the Educational Chairman. Mr. Eggert then proceeded with an interesting illustrated talk on refrigeration controls of both the temperature and pressure types. His talk covered general practice in installation and application of these controls.

● **METROPOLITAN NEW YORK CHAPTER, New York City, May 23**—Seventy-two members and guests were present at this meeting. Ted Swartz of the Refrigeration and Air Conditioning Guild talked briefly on the possibility of the Guild and the chapter getting together on the formulating of a code for the city of New York. He outlined the purpose of the code and expressed the hope that all branches of the industry would work together in getting it passed. D. O. Eggert, of White-Rodgers Electric Co., provided the educational program for the evening, in which he gave an illustrated talk on pressure and electrical types of controls.

● **MONUMENTAL CHAPTER, Baltimore, Md., May 13**—The annual election of officers held at this meeting resulted in the following: J. Scherr, *President*; C. Taylor, *1st Vice-President*; F. J. Piper, *2nd Vice-President*; Wm. G. Thomas, *Secretary*; C. H. Elliott, *Treasurer*; W. F. Houpt, *Sergeant-at-Arms*; Geo. J. Roche, *Chairman, Educational Committee*. Executive Committee—A. Huber and J. B. Ottenheimer. On the educational program W. E. Patten and J. B. Ottenheimer, both members, gave a talk on expansion valves and the proper location of feeler bulbs. They also covered the subject of setting pressure controls and balancing a refrigeration system.

At the June 10th meeting the educational program was started off by George Roche, Chairman of the Educational Committee, who discussed the new Maryland State tax. Jack Ottenheimer explained some phases of the tax, bringing out the important fact that everyone must pay one dollar for license to collect sales tax. The educational film "The Adjustment of Thermostatic and Pressure Controls for Commercial Refrigeration" and "Installing a Cooling Unit" were shown. This was enjoyed by an enjoyable travelog.

● **PENINSULA CHAPTER, Newport News, Va., June 12**—The primary purpose of this meeting was the annual election of officers which resulted in the following: George Blount, *President*; W. W. Poindexter, *1st Vice-President*; W. R. White, *2nd Vice-President*; M. L. Parker, *Secretary-Treasurer*; H. J. Woodcock, *Sergeant-at-Arms*; and E. Zepkin, *Educational Director*. During the brief business session which followed it was decided to suspend further meetings until the second Thursday in September.

● **PROVIDENCE CHAPTER, Providence, R. I.**—New officers elected at the last meeting are: Alfred V. McGuire, *President*; Norman H. Miller, *1st Vice-President*; Charles J. McCormick, *2nd Vice-President*; Louis L. Collamat, *Recording Secretary*; Frank Vieira, *Financial Secretary*; Forrest E. Bryant, *Treasurer*; Frank Struzik, *Sergeant-at-Arms*.

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Trenton chapter held their annual banquet May 14. It was an enjoyable evening of good eats and fun for the 156 in attendance. Marcel Liberty, one of the members, is the photographer.

● ROCHESTER CHAPTER, Rochester, N. Y., May 14—After a brief business session, Educational Chairman John Eggleston took over. On the program, Lewis Nohle, Sr., gave an instructive talk, illustrated through the use of slides, on Kelvinator units. William Stienfeldt of the Engineering Department of Eastman Kodak Co., followed with a talk on refrigeration with heat.

● ST. LOUIS CHAPTER, St. Louis, Mo., May 27—This meeting was jointly sponsored by Alco Valve Company, Brass and Copper Sales Company, N. O. Nelson Company and Illinois Electric Works, and due to the unusually large number of guests present, business was dispensed with. The three attendance prizes of Alco valves were won by Anthony Pisoni, W. A. Goerisch and H. Solomon. President Vizgird welcomed the guests and members, commenting that this was the largest attendance since the last open meeting on January 15, sponsored by Hussmann. He further pointed out the advantages of membership in RSES and extended an invitation to anyone interested to join. President Vizgird turned the meeting over to Dick Meyer, Sales Engineer of Alco Valve Co., who had made the arrangements for this meeting. He began by inviting everyone to remove their coats for comfort and then introduced Bill Meyer of Alco Valve Co., the speaker of the evening. Of special interest was the glass serpentine coil demonstration, showing the action of the refrigerant and oil in a top fed and bottom fed coil, the advantages and disadvantages of each being thoroughly explained. Slides, depicting Alco Valve Company's part in the progress of the refrigeration industry were shown and a very interesting and educational resume was given by Mr. Meyer on the thermo-limit valve, as well as the other products manufactured by the Alco Valve Co.

● SAN DIEGO CHAPTER, San Diego, Calif., May 15—Merle Stutzman was the visitor of the evening who visited the southwest corner of the state to provide a very interesting and practical demonstration on oil separators. Announcement was made to the members that their President, Mr. Hanks, had again

been elected State Treasurer.

● SOUTHERN ARIZONA CHAPTER, Tucson, Ariz., May 12—A delicious dinner was enjoyed by members, their wives, and guests, followed by the regular business meeting with Oral W. Tucker, President, presiding. The guest speaker, W. W. Allison, International President, was introduced by Mr. Tucker. After the purpose of the organization was reviewed by Mr. Allison, local members took the obligation. Mr. Allison then presented the charter to the chapter with Mr. Tucker accepting, and members were given membership certificates.

At the June 9th meeting, 18 members and 14 guests were present to enjoy a dinner preceding the meeting. The principal business of the evening was the election of officers which resulted in the following: Lenord Cole, President; Charles Sullivan, 1st Vice-President; Thomas Gillespie, 2nd Vice-President; B. B. Coffman, Secretary; G. O. Bogle, Treasurer; J. M. Balentine, Sergeant-at-Arms; Oral Tucker, Educational Secretary. Board of Directors—Lenord Cole, Oral Tucker, B. B. Coffman, Ross Hartsmeister, Jack Pattee. On the educational program, Ray Williams of Phoenix gave a talk on ultra-violet ray lamps, followed by a demonstration which proved very educational.

● SPRINGFIELD CHAPTER, Springfield, Ill., May 16—During the business session the auditing committee gave a report on the state of the treasury, which was found in good order. Discussion of the State Association meeting dates was held, and some discussion on the possibility of increasing dues was held over for future action.

● SUNSHINE CITY CHAPTER, St. Petersburg, Fla., May 6—The educational program included a reading of a paper by P. D. Shaw on the use of nitrous oxide gas and its dangers from exposure.

At the May 20th meeting Mr. Petty, Chairman of the Educational Committee, lead a discussion on hermetic units taken from the Society's bulletin on the subject.

At the June 3rd meeting the annual election of officers resulted in the following: S. C. Petty, President; Mote Baird, Vice-President;

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Removes the stubbornest oil ring in a jiffy!
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Karl R. Fogle, Secretary; Russell Kraiker, Treasurer; Bob Johnson, Sergeant-at-Arms; Bill Mays, Educational Chairman. On the educational program, Charles Eberhart discussed troubles he had been experiencing on the Temprite cooler and asked for suggestions regarding a frostback.

● **TWIN CITIES CHAPTER, Minneapolis, Minn., June 3**—During the educational session, President Asproth led a discussion on a new refrigerant known as Genetron 100, which is not yet being advocated for use in refrigeration. He also conducted an interesting discussion on the comparison between "Freon" and methyl chloride, showing the percentage of loss in compressor capacity when methyl chloride is used in a system designed for "Freon." Mr. Golay of Kold-Hold Manufacturing Co., was a visitor of the evening, introduced by Mr. Asproth. The film "Removing and Installing a Compressor or Condenser" wound up the evening.

● **WOLVERINE CHAPTER, Lansing, Mich., June 9**—The annual election of officers held at this meeting resulted in the following: Glen Ormsby, President; Rial Kellogg, Vice-President; Glenn Cripps, Secretary; Fred Stevens, Treasurer; John Bush, Sergeant-at-Arms.

● **WORCESTER CHAPTER, Worcester, Mass., May 20**—The new officers elected at this meeting are: Francis L. Foley, President; Wilrose J. Hanson, 1st Vice-President; James M. Stevenson, 2nd Vice-President; John J. Brosnan, Secretary; Robert D. Horton, Treasurer; Edmond E. LaFlamme, Sergeant-at-Arms; Marshall W. Lewis, Chairman, Educational Committee. Board of Directors—Myron A. Maynard, Harry C. McCoy and Francis H. Turner.

LADIES' AUXILIARY

● **KANSAS CITY AUXILIARY, Kansas City, Mo., June 19**—A general business session was held by the ladies, followed by entertainment and refreshments served by the committee. Mrs. Haller conducted two games in which the prizes were won by Mrs. Shirley and Hazel Brown. The prizes awarded were plastic clothes covers and a plastic apron, and also a set of eight glass coasters. Ice cream, cake and coffee were served as refreshments by Hazel Brown, Ruth Ferguson and Maxine Miller.

AIR CONDITIONING LOADS (Continued from page 48)

ditioned spaces, as well as the ceiling, in this case, are estimated at 10 degrees because the air in these places usually is less than outside temperatures. Eight degrees is sometimes used for ceilings under unconditioned spaces. Basements used for storage only are usually conditioned at room temperatures so no heat gain will occur through the floor.

The South wall, composed of 210 sq. ft. of masonry construction, because of its

southern exposure to the sun at the time of maximum load, is assumed at 10 degrees in addition to the air temperature difference of 15 degrees, making 25 degrees. The glass in this wall, 210 sq. ft., is given a 65 Btu. per square foot solar gain and 15 degree temperature difference and 1.1 conduction.

Heating Load Estimate

If the estimate is to include the winter heating load, this will consist of the conduction and ventilating and infiltration heat losses. These are figured exactly as for the summer load, except that the temperature differences will be greater. This will be the difference between the temperature to be maintained inside and the lowest temperature likely to occur outside. Only air and conduction losses need be considered, as the other sources assist, rather than add a load to the heating device. In most locations and installations, there is usually about the same summer cooling load, as there is winter heating. This will be very convenient for the designer of reverse cycle year around conditioning units.

Summary

Once the load is carefully calculated, the equipment should be selected which will, running continuously, carry the estimated load. This estimate covers maximum load conditions, which only occur for relatively short periods, and the equipment should be expected to operate continuously during these periods. To allow for cycling during extreme conditions will add needless expense and result in reduced operating efficiency, but thermostatic regulation usually provides for cycling during periods of light load.

MORE LIGHT FOR COOLERS (Continued from page 43)

and at 0°F twice as much light—without making the cooling equipment work any harder.

It should be noted that these figures are based on no draft blowing on the lamps. If drafts blow on the lamps it upsets these conditions because the insulating jacket of relatively warm air around the lamps is carried away. The lamps will then produce less light because of the cooling effect. Reflector units with closed bottoms will, of



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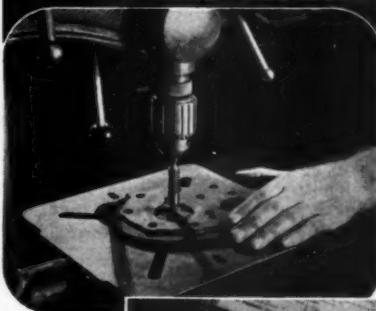
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KIT Pays for itself by Reoperat-
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July, 1947

course, be less affected by this factor than the open units or the bare lamp units.

Starting of Fluorescent Lamps

It should be realized that under certain temperature conditions some fluorescent lamps may be difficult to start. Most fluorescent lamps require a higher voltage to start when they are cold, for example at 32 F or 0 F, than when they are at a more normal temperature of 50 F or above.

Recommendations for satisfactory starting are included in Table III.

Table III—Satisfactory starting of certain fluorescent lamps can be expected at temperatures below normal.

	Satisfactory Starting 0-32 F. 32-50 F. 50 F. up		
All Fluorescent Lamps and Certified Starters	X		
96" T8 Slimline			
72" T8	X	X	
42" T6 Slimline			
64" T6			
40-watt Instant Start with starting stripe	X	X	X
40-watt Low Temperature with FS-44 starter			
100-watt Preheat Start			

N.B. Rated voltage on the primary of the ballast equipment will assure satisfactory starting at temperatures below those indicated in the table.

It is customary to install fluorescent lamps either on a metal channel which holds the sockets and the ballasts or in a metal reflector. The presence of this metal strip near the lamp makes fluorescent lamps easier to start and it is one of the best aids to lamp starting known today.

Summary

The discussion points the way to the better fluorescent lamp and reflector combinations as indicated by the test data available at the present time, and although additional experience and testing may suggest other methods, it is now possible to improve the usually poor lighting in coolers by using the information given.

1. The best lamps for use in coolers are those listed in Group A.

2. The addition of a suitable reflector will materially improve the efficiency of light output of any of the fluorescent lamps at temperatures below normal.

3. Lamps in Group B such as the popular

40-watt T12 may be expected to operate satisfactorily on instant starting equipment down to 0 F if placed in reflectors.

4. The cooling effect of wind or draft on the lamps may eliminate any of the benefits derived by the use of reflectors. Every effort should be made to place the luminaires where they will be relatively free from this effect.

* * *

ESTIMATING

(Continued from page 40)

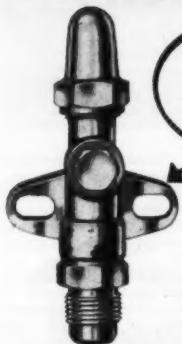
it just so happened that I had the equipment on hand to do this job and that I had acquired this material at a very reasonable price, and that I needed the money this job would bring to meet my commitments. They were somewhat mollified, and after thinking it over they tumbled to how I had been able to make such a bid.

Here is the story of how I was able to underbid my competitors by 25%. A few weeks before I had been called to a nearby town to service a plant that had just recently been installed. The installation was all right, but the unit just wasn't large enough to handle the load. I told the owner this. He asked me if I would install a larger unit that he had on hand. I had hoped to sell him a new unit, but since he already had one I agreed to do the work. It took only a few hours to make the change. A few days later I called back and found that the plant was operating to the satisfaction of the owner. When I presented my bill the owner told me that he had been under heavy expense lately and was very short of ready cash. Would I be willing to take the old unit in payment of my bill. Since the unit was worth at least four times the amount of my bill I jumped at the chance. Now this unit happened to be exactly the size needed for the installation in question. You won't get many windfalls like this, but it does happen.

Now it may be that in this instance my business methods were questionable, but I don't think so. It came under legitimate competition. And whether it is legitimate or not, you will certainly have this situation to deal with many times. The moral is—don't be hasty in evaluating your competition. There are many factors involved and if you jump to a conclusion it may put you off on the wrong track and lead to disaster. In such a case it might be wiser to do as I did. Let your competitors find out exactly how the situation was. This might stop a price cutting war that would be ruinous to all concerned.

(To be Continued)

Another SUPERIOR FIRST



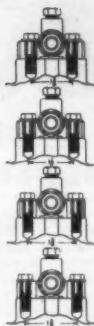
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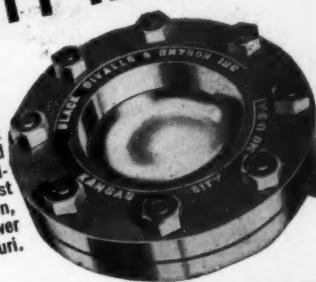
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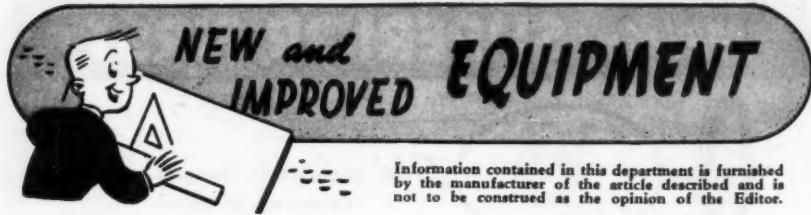


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Fruit Vendor

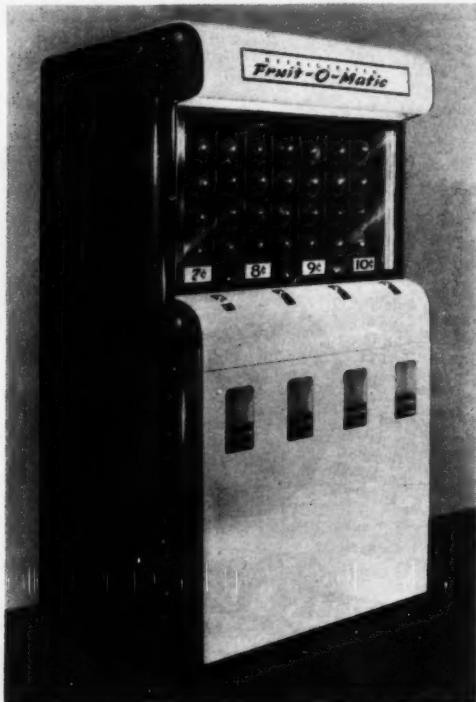
THIS article introduces a new coin-operated multi-fruit vending machine now making its appearance on the American consumer market. "Fruit-O-Matic" is the name of this fully automatic, refrigerated vending machine that will automatically deliver the correct change and a cold, juicy, tasty apple, orange, pear or what have you for the mere insertion of a single five or ten cent piece. It is believed that the "Fruit-O-Matic" is the only vendor that

delivers a refrigerated piece of fruit, anywhere from 1¢ on up to 10¢.

"Fruit-O-Matic" research points out that it will also prove of value to industrial plants who have industrial relation men that are endeavoring daily to promote good will. It is a known fact that the daily consumption of fresh fruit is an aid to good health. Therefore, "Fruit-O-Matic" delivering refrigerated fresh fruit on the spot can go far in promoting good will and good health. Research further points out that

schools, recreation centers, hotels, hospitals, theatres, plants, etc., the country over would be good location points for fresh fruit vending now capable with the "Fruit-O-Matic."

"Fruit-O-Matic" is smartly modern in design, housed in an attractively designed metal casing of red and cream and is beautifully illuminated. Each vendor is quickly and easily loaded with 208 individual pieces of fruit by merely unlocking and opening the front triple-plate display glass which completely eliminates moving the unit. The display glass was designed to completely prevent frosting and displays approximately 90 individual pieces of fruit separately suspended. Four separate rotary bands electrically operated individually control the vending of 52 pieces of fruit each, therefore permitting each "Fruit-O-Matic" to vend four different types of fruit at a cost to the consumer of anywhere from 1¢ to 10¢. A good deal of thought has been given also to easy servicing of the refrigeration unit. A simple disconnect method permits the refrigeration unit to be free of the vendor by simply removing from the mounting tract. Patents are now pending covering the protection of "Fruit-O-Matic" design. Ten units are now in the field and have been very successfully received by the consumer. Further production facilities and material procurement negotiations are now in progress and it is planned to have "Fruit-O-Matic" on a regular production basis for availability within 90 days to those individuals or groups and organizations that have sources of fruit supply and efficient methods of distributing merchandise to every "Fruit-O-Matic" that they maintain.



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Industrial CLEANER

Continuous-duty 1-1/3 H.P. motor delivers air at high velocity—blasts out hidden dirt. Or used as vacuum cleaner, powerful suction sweeps up all particles. Perfect for spraying paint, lacquer, insecticides—also for drying purposes.



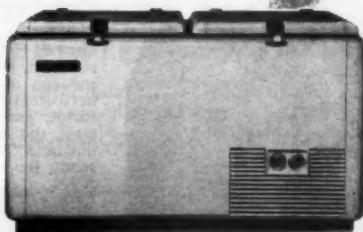
Eliminate fire and explosion hazards... reduce deterioration due to dust and grit... save on cleaning costs with the new Ideal "Hand-Type" Cleaner. It's lighter in weight—only 14½ lbs.—perfectly balanced. Easy to carry and use—less operator fatigue. Quickly interchanged attachments for many vacuum cleaning, spraying and drying jobs. Medium-duty, light weight model also available—½ H.P., 9½ lbs.

Write for New Bulletin on Industrial Cleaners

IDEAL INDUSTRIES, Inc.
Successor to Ideal Commuter
Dresser Co.
1093 Park Ave., Sycamore, Ill.

Distributed Through
AMERICA'S LEADING
WHOLESALEERS

*Engineered,
Precision-Built*
**FOR LASTING
SATISFACTION**



BEN-HUR
Farm & Home Freezer

You would choose a BEN-HUR—if you could compare all the details of welded steel construction, hermetically sealed insulation, economy-engineered operating efficiency, smart styling and lifetime-tested food freezing and storage facilities.

For a BEN-HUR is built to stand out in a point-by-point engineering analysis—and a feature-by-feature "guarantee" of satisfaction in home use. A BEN-HUR means ready sale and a lifetime of pleasure in food protection. It's built on a 37-year-old experience in quality manufacture.

If you want lasting customer good will—the kind that means steadier income—look into the famous line of BEN-HUR FARM AND HOME FREEZERS.

BEN-HUR MFG. CO.

Continuous Manufacturing Since 1911
Dept. RS, 634 E. Kees Ave., Milwaukee 12, Wis.

BEN-HUR

Dehydrator Kit

AN ENTIRELY new item, A exhibited for the first time at the Refrigeration Equipment Wholesalers' meetings, Chicago, was the "Rapid" Dehydrator Kit.

The idea of a Kit for servicemen to carry in their service cars for storage of dehydrators is a new and practical innovation to the industry.

The "Rapid" Dehydrator Kit is of convenient size, measuring 8½" square on the top and standing 18" high. It has a hinged lid and



hinged side, which offers ready access to any of the six various size dehydrators, ranging from 5 cubic inches to and including 50 cubic inches. Two sliding drawers are provided for replacement adapters and gaskets. Flat folding handles are provided for carrying the Kit to the wholesaler for refill.

It is suggested that the kit idea, because of its containing greater quantities of the more popularly used dehydrators, will be a boon to service men, saving them many needless return trips to the wholesaler's to pick up single requirements. The kit also assures delivery of clean packages to the place of installation. The old adage of "a place for everything and everything in its place" distinctly applies to this kit. Wholesalers who viewed it at the convention were quick to grasp the utility of the item.

The kit is made of 20-gage metal and contains partitions for eighteen dehydrators. Kits are supplied complete with dehydrators. All dehy-

drators are of the refillable type.

The Fine Products Company of Chicago, who introduced the Kit, advise that the kit will be available through refrigeration wholesalers and that an introductory offer will be made permitting the kit to be obtained for slightly more than the cost of dehydrators and replacement parts.

Aquatower

THE Marley Company, Inc., is offering the new Aquatower to the air conditioning and refrigeration field as an answer to the demand for a compact cooling tower of modern design with a high performance rating. Completely assembled at the factory, the Aquatower is sent out as a "packaged product" ready for operation.



Constructional features of the tower are: Designed with standard components, no special pumps or motors to return to the manufacturer for service. Engineered for indoor or outdoor service. Heavy steel integral welded case painted aluminum. Sized from 3 tons to 15 tons of refrigeration. Available with or without pumps. All component parts readily accessible for servicing. Field tested for several years. Sturdy fan guard insures safe operation. Complete operation and maintenance instructions furnished. Designed for Air Conditioning and Refrigeration.

Non-Froster

A NEW product, Pegg Non-Froster, has just been introduced on the market, that prevents ice trays

from freezing to refrigerator compartments, as well as frozen food packages from doing the same.

Pegg Non-Froster is a chemically-treated liquid, packaged in a bottle with a sprayer. It is sprayed in the tray compartment of the refrigerator . . . preventing the tray from freezing to the compartment and enables it to slide freely. It is harmless, odorless and non-injurious to foods or liquids when applied to the ice cubes tray compartments.

Pegg Non-Froster is a product of the Pegg Chemical Products Co., Phila., Pa. It is bottled in a 2½ ounce container with a special spray cap, a sufficient quantity to last the average house refrigerator about six months . . . and is priced to retail at One Dollar.

Fountain

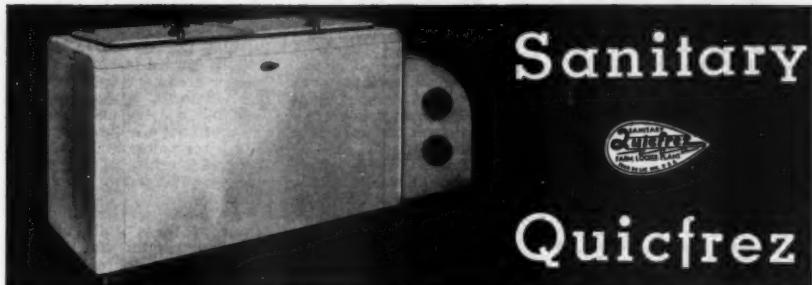
PRODUCTION of a new wall type drinking fountain, incorporating a Temprite Water Cooler, is announced by Tal-Co Manufacturing Company, Keokuk, Iowa.

This unit is furnished complete as shown in the photograph, with the Temprite Cooler built into the porcelain fixture, angle stream drinking jet and mouth guard designed to comply with all sanitary codes, and a stream height control valve which



automatically regulates the height of the drinking stream. The fixture is of durable white porcelain on cast iron. All exposed hardware and drain trap are finished in rich, heavy chrome plate. Installation is extremely simple.

The Tal-Co Multiple Outlet Water Cooling System eliminates the many objections found in the circulating sys-



THE PIONEER OF FARM LOCKER PLANTS NOW READY FOR IMMEDIATE DELIVERY!

COMPLETE, with Condenser Units—ready for you to install. EVERYTHING about the "QUICFREZ" Farm Locker Plant is engineered and built for years of dependable service. Thousands in daily operation since 1939. PLACE YOUR ORDERS NOW! Prompt shipment assured.

Several Exclusive Franchise Territories are still available. Write or wire for details.

SANITARY REFRIGERATOR COMPANY
FOND DU LAC, WISCONSIN

Manufacturers of Ice Refrigerators for Over 40 Years—QUICFREZ Farm Locker Plants Since 1939

LEAKY TERMINALS ON ALL SEALED CROSLEY F-12 UNITS

EASILY REPAIRED IN A FEW MINUTES WITHOUT OPENING THE COMPRESSOR

SET OF THREE TERMINALS (PART NO. 1020)	\$6.75	INSTALLATION TOOL (PART NO. 23051)	\$1.65
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★ ★ ★

Part No. 1050—Packing Washers for Norge Terminals. Repairs terminal leaks on all sealed Norge units in cases where the terminals are not shorted. Installed from outside. 9 Washers.....	\$1.00
Part No. 1100—Complete terminal assembly for Norge units. Replaces shorted terminals on all sealed Norge units. Installed from inside. Set of three.....	2.85
Part No. 1060—Complete terminal assembly for Frigidaire Meter-Miser units. Installed from inside. Set of three	2.85
Part No. 1030—Complete terminal assembly for Westinghouse units. Installed from inside. Set of three	2.85

★ ★ ★

IMMEDIATE DELIVERY—MONEY BACK GUARANTEE

WRITE FOR BULLETIN NO. 14 LISTING OTHER TERMINALS, FLOAT REPLACEMENTS AND ADDITIONAL PARTS FOR SEALED UNITS.

3097 Third Ave. **SEALED UNIT PARTS CO.** New York 56, N. Y.

tem hitherto employed when cooled water was required at a number of outlets. In the Tal-Co System, with individual coolers built into the respective fountains, same can be located as desired and all operated from a conveniently placed condensing unit.

This Temprite Cooler in the Tal-Co fixture cools the water directly and instantaneously at each fountain as it is used, rendering unnecessary the heavily insulated water circulating lines, pump and motor, which are costly to install and which represent continuous upkeep and loss of refrigeration. In many circulating systems, the line losses are actually greater than the water cooling load. All of these losses are eliminated with the Tal-Co System, which is ideally suited for factories, hospitals, apartments, schools, hotels, public buildings, etc.

The Tal-Co fixtures are manufactured under exclusive patent license agreement with Temprite Products Corporation.

Rodenticide

WIDER public use of Antu is predicted by the Du Pont Company as a result of two recent official government rulings. Antu is the popular name for Alphanaphthyl-thio-urea, the new rodenticide developed by the OSRD during the war, with the cooperation of Du Pont.

The United States Department of Agriculture, Bureau of Animal Industry, Meat Inspection Division, now permits the use of Antu rodenticides throughout meat-packing plants. A recent circular, issued in Washington, said: "Extensive experimentation with Antu in official establishments and elsewhere has shown this rodenticide to be an effective agent for killing the common gray-brown Norwegian rat . . . The Norway rat is usually the only variety of rat found in meatpacking plants, except for a few places in the southern part of the United States."

Commenting on this action, E. H. Rieman of the Grasselli Chemical Department of the Du Pont Company said:

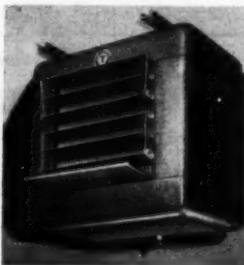
"We are gratified that this constructive action has been taken. The acceptance of Antu by these high authorities stems from closely su-

pervised tests employing Du Pont Antu which were initiated more than a year ago. At the same time we would like to emphasize that while Antu is not as dangerous as most rat poisons, it nevertheless is a poison and should be handled carefully."

The Post Office Department, which heretofore has prohibited rodenticides from being sent through the mails, has recently modified its regulations in that regard. Except for certain minor provisions, Antu-based rodenticides may now be transported by parcel post.

Cooling Units

ONE of the problems faced in cooling a group of large rooms or common areas of moderate size has been overcome through employment of a new insulated Unit Cooler, just announced by Tenney Engineering, Inc., 26 Avenue B, Newark 5, N. J., manufacturers of temperature and humidity control equipment.



It is claimed that several of these insulated comfort coolers, remotely located and operated from a common condensing unit, permits cooling of a considerable area without the necessity for running exposed ducts or the expense of hidden duct work. An economy of space and a minimum of installation work is a further advantage claimed.

It is stated that this product, because of the efficient insulation of the casing, may be used for either comfort cooling or commercial refrigeration without the inconvenience of providing drip pans to receive the condensation which invariably forms on the outside of casings not thoroughly insulated.

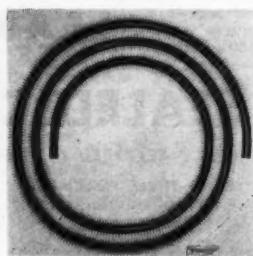
The manufacturer states that sizes are available for cooling spaces up to 15,000 cu. ft. in volume. Where larger areas are to be cooled, or where it is desirable to provide a more even dispersion of cool air, the manufacturer recommends the use of multiple units, strategically located in several areas for best results.

It is stated that applications of these units include comfort cooling for offices, small stores, storage spaces and work rooms, or they can be used in refrigerators of meat markets, florists, bakers and for other types of product storage.

Sizes of these units are stated as ranging from $19\frac{1}{4}'' \times 12\frac{1}{4}''$ to $43'' \times 23\frac{1}{4}'' \times 12\frac{1}{4}''$. Each unit is finished in a beautiful maroon crackle outside coating.

Fin Coils

COILED finned tubing of the recently developed serrated fin type has now been made available for general industrial use by Fin-tube Coil Corporation of 19 West Main Street, Alhambra, California, under the trade name "Finco."



Utilizing a new bending technique, flat or pancake coils are now formed out of tubing with serrated fins as high as $\frac{1}{8}$ inch without crushing or distortion of the fins.

Substantial savings are claimed by the manufacturer in the fabrication of condensers, evaporators, unit heaters and coolers, coils for refrigerated vending machines and many other types of extended surface equipment.

Finco flat coils are now available in either ferrous or non-ferrous materials and in a wide range of tube sizes, fin heights, fin spacings and coil diameters.

REMOTE WATER COOLERS



For drinking water
bubbler service, glass
filler service, photographic developing, etc.
Compact for floor, wall or ceiling installation.
Capacities 6 to 25 gallons.

Also available now—
cafeteria glass filler coolers,
self-contained type
bubbler coolers for offices,
stores or factories. Write
for latest data.



DO YOU REPAIR ELECTRIC MOTORS?



It so—WRITE NOW for the new
HARCO 1947 CATALOG
of complete up-to-date information on all makes
ELECTRIC MOTOR PARTS, BEARINGS, BRUSHES
CAPACITORS, COUPLINGS and PULLEYS

LIMITED EDITION because of paper shortage—WRITE AT ONCE

Name _____

Street _____

City-State _____

HARCO EQUIPMENT CO.

2456 NINTH STREET, N.W. WASHINGTON 1, D.C.

RANCO PRESIDENT HONORED BY OHIO STATE UNIVERSITY

IN RECOGNITION of his achievements in the field of refrigeration engineering, E. C. Raney, President of Ranco, Inc., was awarded the Lamme medal at the commencement exercises held June 6 by Ohio State University. The Lamme Medal is awarded each year by the university to an Ohio State alumnus who had distinguished himself by engineering achievement.

Mr. Raney, whose company for many years has been the world's largest manufacturer of thermostatic controls, received his degree in mechanical and electrical engineering from Ohio State in 1912. He also attended Ohio University at Athens.

Mr. Raney developed the controls which his company now manufactures, as well as the automatic reclosing circuit breaker which it previously produced. With a few friends, he organized the Automatic Reclosing Circuit Breaker Company in 1918, engaging in the production of circuit breakers used in electrically operated coal mines, as well as in steel mills and on interurban electric railways.

Later, with the development by Mr. Raney of a refrigerator control, the company abandoned the manufacture of circuit breakers and concentrated on the thermostatically operated control devices. In 1936, the name of the company was changed to Ranco, Inc. The plant is located in Columbus, Ohio.

AIRSERCO REPAIRS GRUNOWS

EMMET C. WILLIAMS, president of Airserco Manufacturing Company of Pittsburgh, announces that factory facilities are now available for complete reoperation for all types of Grunow refrigeration



E. C. RANEY

units. A new catalogue has been prepared containing price lists and showing the various Grunow parts available for shipment. Mr. Williams also disclosed that the new eight page Airserco catalogue, A-47, complete with price lists is now available for mailing and is being distributed to refrigeration wholesalers and service men throughout the nation.

One of the features of this new production announcement is that all Grunow products assembled by Airserco are individually packaged and shipped under the Airserco label. Parts are available through their usual wholesale channels throughout the refrigeration field.

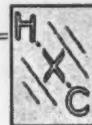
HENRY VALVE APPOINTS BYTH

THE Henry Valve Company announces the appointment of Douglas R. Byth as Sales Engineer to cover the Territory North and West of Chicago.

Mr. Byth is a graduate of Northwestern University, where he majored in mechanical and civil engineering. During the war he served as a Commander in the U. S. Navy for approximately five years in an engineering capacity. Most of this time was in overseas duty. He has had considerable experience as a Sales Engineer on mechanical devices.

HALSTEAD & MITCHELL PRODUCE NEW TWO-STAGE CONDENSER

HALSTED & MITCHELL, manufacturers of water cooled condenser, have announced production, for certain sizes, of their new two-stage double-tube, counter-flow, condenser. According to the company, these new two-stage condensers incorporate the same cleanable feature which has been a characteristic of the regular Halstead & Mitchell line.



HEAT-X

CAST ALUMINUM HEAT EXCHANGERS



A model for every application

See your jobber for literature. Ask to see the Complete Heat-X Line.

THE HEAT-X-CHANGER CO., INC.

415 LEXINGTON AVENUE, NEW YORK 17, N. Y.

BREWSTER, N. Y.

HERVEEN the Replacement Refrigerant

Servicemen—Herveen is the IDEAL REPLACEMENT GAS for Meter-Misers. When your Frigidaire Meter-Miser customers need service on their unit, don't turn them down with the statement "the refrigerant is not available." We can deliver

HERVEEN  the IDEAL
REPLACEMENT REFRIGERANT

Many service companies are using this refrigerant for charging Meter-Misers in their localities.

- ★ Meter-Miser calls are routine with a supply of HERVEEN.
- ★ Installing HERVEEN does not involve more than average care.

For deliveries, see your local jobber or write to

Conservative Gas Corporation, Modern Gas Division
MANUFACTURERS AND REFINERS
1084 Bedford Ave. **Brooklyn 5, New York**



Byron Halstead of Halstead & Mitchell explaining the new two-stage tube arrangement of their latest condenser to Hugo Smith, the company's new North Central states representative.

Through the adaptation of the two-stage principle, a greater concentration of water tube copper surface is achieved, and improved velocity characteristics in the gas or refrigerant passages are realized by increasing water tube size in the lower portion of the unit.

The two-stage design was developed by the firm as an improvement over former methods used. It permits a greater gas passage capacity in the top section of the units, thus eliminating the necessity of experiencing a pressure drop through the unit. In adopting this method of increasing the internal concentration of copper through the use of a larger water tube, the company has been successful in stepping up efficiencies.

Halstead & Mitchell condensers are distributed throughout the country by leading wholesalers in all principal cities, and the foreign market is served by Melchoir, Armstrong and Dessau Company.

THOMAS COYLE RETIRES

THOMAS COYLE, manager, of the Du Pont Company's Chlorine Products Division, will retire May 31 after more than 40 years in the chemical industry.

The Du Pont Company also announced today that the Chlorine Products Division and Solvents Division would be merged into the Chlorine Products Division.



THOMAS COYLE



HARRY ALTER DETROIT WEEK

A week in May was set aside as "Detroit Products Week" at the counters of Harry Alter Co. in Chicago and New York, during which demonstrations of Detroit Lubricating Co. products were held. The interest displayed in the demonstrations conducted by Dan Gott and his assistant, Randolph Smith, is shown in the above photo taken at the Chicago display.

**For
Efficient
Refrigeration**

New
K-20-5
ELECTRO-MAGNETIC
VALVE



For complete specifications on Automatic Pressure, Temperature and Flow Controls, request new Catalog 52C.

GENERAL CONTROLS
801 ALLEN AVENUE GLENDALE CALIF.

FACTORY BRANCHES: PHILADELPHIA • ATLANTA
BOSTON • CHICAGO • KANSAS CITY • NEW YORK
DALLAS • DENVER • DETROIT • CLEVELAND • HOUSTON • SAN FRANCISCO • SEATTLE • PITTSBURGH
DISTRIBUTORS IN PRINCIPAL CITIES

BETTER WORK
from Quickee-clean hands!



Your hands are the most valuable tools of all! Grime, grease and dirt cut down their efficiency—more than you know. Cracked skin, chapping make them stiff and clumsy. For more, better work, take care of your hands!

New, different QUICKEE removes grime...grease...paint—in 17 seconds flat! Contains LANOLIN—good for the skin, prevents chapping. Uses NO WATER. Saves time, trouble and money.

TRY QUICKEE on the job—at home!



Send for
FREE SAMPLE
QUICKEE
WATERLESS
HAND CLEANER
TUDOR CHEMICAL SPECIALTIES, INC.
Tudor Bldg., New York 53, N.Y.

SERVICE ENGINEER



Too bad you aren't an ostrich—particularly when a tough, puzzling service problem comes up. But you can't duck it the way the ostrich tries to and expect to stay in business long!

Newcomers, yes, and old-timers, too: you never know when a puzzling service job will face you. Then's the time when you'll wish you had the sound knowledge which comes with proper training to back you up.

TAKE U.E.I. TRAINING

Successfully training men in refrigeration since 1927, Utilities Engineering Institute gives you the kind of training you can use as a sound basis on which to build up or as a brush-up on facts you may have forgotten—training proved by the many U.E.I. men who are in the service business today!

Write today for
FREE facts about
U.E.I. Balanced
Training—technical
home-study
combined with
shop practice.

MAIL THE
COUPON NOW

**VETERANS:
TRAIN WITH
U.E.I. UNDER
THE G.I. BILL**

UTILITIES

Engineering Institute

2525 N. Sheffield Ave.,
Dept. 45, Chicago 14, Ill.

Please give me more information about Refrigeration and Air Conditioning Training, as promised in your Refrigeration Service Engineer July 1947 ad.

Name

Address

City Zone State

UNIVERSAL PERSONNEL CHANGES

ANNOUNCEMENT was made recently by F. S. McNeal, General Manager of Universal Cooler Division and Vice President of International Detrola Corporation, that T. S. Pendegast, Director of Sales, was assigned to the new position of Assistant to the General Manager. Mr. Pendegast has held the position of Director of Sales for the Universal Cooler for several years joining the organization in 1931 and is widely known throughout the refrigeration industry.

In conjunction with the above statement was announced the appointment of Johnston P. Scott to assume the responsibilities of Director of Sales, and he will work under the direction of the General Manager. Mr. Scott has been connected with Universal Cooler

company in Missouri, Kansas, Colorado, southern half of Illinois, southern half of Indiana, and Kentucky.



H. C. SMITH



C. W. WILMES



T. L. PENDERGAST

J. P. SCOTT

Sales Department as a sales representative for the past four and one-half years with the exception of the past six months when he was working directly from the Detroit offices.

LIQUID CARBONIC OPENS NEW \$1,000,000 MORRISON PLANT

MORE than 3,000 people attended the open house held by The Liquid Carbonic Corporation to officially open its new million dollar ice cream cabinet and Frostair plant in Morrison, Illinois, May 24. The open house climaxed a three months' public relations program by the company in cooperation with the newspapers and business men of Whiteside county, in which Morrison is located. Through news articles and full page advertisements Whiteside county residents were told of the expansion of the company throughout the world and its plans for Morrison.

The Liquid story is one of 59 years of constant growth and development. Beginning in 1888 when Jacob Baur, a Terre Haute druggist, decided it might prove profitable to manufacture and market carbonic gas in steel cylinders under the "Liquid Carbonic Acid Manufacturing Company" label, the company has progressed and expanded. Today the Liquid Carbonic Corporation is the

NEW REPRESENTATION FOR REMCO

K. M. NEWCUM, president, Remco, Inc., announced recently the appointment of two new sales representatives. Hugo C. Smith will cover the states of Ohio, western Pennsylvania, West Virginia, and eastern Michigan.

A native of Buffalo, N. Y., Mr. Smith's first connection with the refrigeration industry was in commercial sales for Frigidaire Sales Corporation in 1928, working for their Rochester, Syracuse, Buffalo and Miami, Florida offices. In 1937 he went with Carrier Corporation as sales engineer, holding successive posts in Kansas and Cleveland. From 1944 to 1947 Mr. Smith covered the same territory as noted above as field engineer for the Alco Valve Company.

Charles W. Wilmes will represent the

Fine PRODUCTS

DESIGN-ENGINEERED
FOR RUGGED SERVICE

You'll find every practical feature in

RAPID Refillable DEHYDRATORS

... Really dehydrate because balanced dimensions provide maximum dispersion area, thorough contact with silica gel. Sturdy one-piece, leakproof shell, triple sealed, truly non-collapsible. Removable, large area, finger type screens permit complete cleaning, prevent damage. Bronze reinforcing spring in outlet screen.



YOUR WHOLESALER

has Rapid Dehydrators in eight practical sizes : 5, 10, 20, 30, 40, 50, 125, 200 cu.in. Type number stamped on each for easy recognition

Fine PRODUCTS CO.

185 NORTH WABASH • CHICAGO 1, ILLINOIS



For TEMPERATURE For MOTOR OPERATION	{ 2 Recorders* For Less Than The Price of One
--	---

The TEMPSCRIBE Recorder is outstanding for its universality. Any TEMPSCRIBE can be quickly converted from temperature recording to time-operation recording simply by changing the door of the instrument. A widely-used combination comprises one clock case (having a 24-hour spring-wound movement) and two doors (one with a bi-metallic temperature element, and one with mechanism for recording motor on-and-off time).

This economical set costs very much less than a dual recorder. Even two complete TEMPSCRIBES, to obtain simultaneous records of temperature and motor operation, cost no more than you would normally expect to pay for a single instrument that makes dual records, yet give you all the advantages of two separate instruments!

Bulletin 704 gives list of ranges, practical application data, and complete details.

Ask Your Wholesaler, or Orders Filled Direct.

BACHARACH Industrial Instrument Co.

7008 BENNETT STREET • PITTSBURGH 8, PA.



Delay Is Dangerous!

While you're waiting . . .

DUST is accumulating
FRICTION is wearing
HEAT is increasing

Blow out dust, dirt and oily fuzz with the TORNADO Portable Electric Blower. Keep motors, shafting, machinery clean—cool—smooth-running—with a tremendous blast of clear, dry concentrated air which removes all accumulations. Used anywhere in the plant. Plugs into any electric outlet. Produces an air stream with a velocity of 295 m.p.h.

WRITE TODAY FOR LITERATURE OR FREE DEMONSTRATION

Learn how you can reduce maintenance and repair costs, and keep your equipment operating smoothly at full capacity. Write

BREUER ELECTRIC MFG. CO.
5090 Ravenswood Ave. Chicago 40, Ill.



This new Liquid Carbonic Corp., plant in Morrison, Ill., pictured above, was officially opened in May during a two-day open house. The flowers in the lower picture were presented by friends of the company at the opening.

world's largest manufacturer of soda fountain equipment, of carbon dioxide, of beverage bottling machinery and of bottler's extracts.

Byron E. James, general manager of the plant, sets present production figures of the Morrison plant at 75 Frostairs per day and 25 ice cream cabinets per day. The latter production, he said, would increase soon, but has been "curtailed temporarily" due to a few existing

parts shortages. He believes that the Frostair assembly line will reach full capacity within a month and that the ice cream cabinet line should be near capacity within two months.

The Frostair refrigerator is a deluxe household refrigerator combining a large capacity home freezer of $3\frac{1}{2}$ cubic feet with a full-fledged $7\frac{1}{2}$ cubic foot household refrigerator in a single unit. It includes a 90 cube freezer unit for making ice cubes and a two-and-one-half bushel frozen food locker. The Frostair provides three zones of controlled cold—one at 40 F. for food storage, one for ice cubes and one for storing frozen foods.

Red Diamond ice cream cabinets are being manufactured at the Morrison plant in four, six, eight and twelve double hole cabinets.



B. E. JAMES



—and first in line with features that bring the best in low-maintenance, easy-to-service water cooler performance. OASIS Electric Water Coolers offer extra lowside efficiency . . . smooth-working dial-type bubblers of highly simplified design . . . rugged, long wearing construction in every detail . . . many other advantages developed during EBCO'S 20 years of water cooler leadership. Full range of sizes for all types of installations, in bottle or pipe-connected pressure models. Write for details.

EBCO glass filters also available.

THE EBCO MANUFACTURING COMPANY
401 W. Town St., Columbus 8, Ohio



MANUFACTURERS OF

Ice Cream Cabinets

Farm and Home Freezers

Frozen Food Display Cabinets

Soda Fountains and Bob Tails

JUST OUT!



4 Books In One!

Covering:
Basic Principles;
Servicing, Operation,
Repair of

1. Household
Refrigeration

2. Special Refrigeration
Units

3. Commercial Industrial Refrigeration

4. Air Conditioning
Systems

A gold mine of essential important facts for ENGINEERS, USERS AND SERVICEMEN. Here you have at your finger tips end-of-the-line Library in ONE VOLUME, the necessary data you have been looking for on: MODERN UNITS, SYSTEMS AND MACHINES, REFRIGERANTS, REFRIGERATION, Lockers, Water Coolers & Air Conditioning Systems.

ANSWERS YOUR QUESTIONS.

1280 Pages, 46 Chapters all Fully Illustrated & Indexed for Ready Reference.

4 COMPLETE • PAY ONLY \$1 A MONTH
Get This Information for Yourself. Mail Coupon Today.
No Obligation Unless Satisfied. ASK TO SEE IT.

AUDIEN Publishers 49 W. 23 St. N. Y. 10
MAIL AUDIEN NEW REFRIGERATION GUIDE for examination. If O.K. I will send you \$1 in 7 days; then remit \$3 monthly until price of \$4 is paid. Otherwise I will return it.

Name _____

Address _____

Occupation _____

Employed by _____ RII

Plans for the future call for the production of three and four hole single row cabinets. All of these Red Diamond cabinets are used for the storage of bulk ice cream and are made for commercial installation.

COLEMAN PURCHASES RIGHTS TO TUTHILL FREEZER

THE Coleman Equipment Company, located at 7529 South Cottage Grove Avenue, Chicago, Illinois, has purchased the right, title and interest in and to all patterns, dies, drawings and fixtures relating to the manufacture of Tuthill counter freezers; also the inventory of service parts. This announcement was made recently by H. T. Kessler, vice president of the Tuthill Pump Co.

Under the terms of the purchase, the Coleman Equipment Company has the sole and exclusive right to display the words "Tuthill Freezer" on products manufactured by it from designs furnished by this company.

The Coleman Equipment Company has had many years' experience in the manufacture, sale and service of refrigeration equipment and is well qualified to fill requirements for counter freezers and also service parts on all models of counter freezers.

C.T.I. INTRODUCES NEW PAPER

COMMERCIAL Trades Institute, 1400 W. Greenleaf, Chicago, is now publishing a monthly newspaper, Skilled Tradesman. Containing a variety of interesting reports of industrial developments, the publication has been prepared for the students and graduates of the school. It is also of interest to people desirous of preparing for advancement in the refrigeration industry, and to employers who wish to know of a source for competently trained men.

In addition to the reports of new industrial developments, the newspaper contains several valuable features such as informative articles for men planning to go into business, and instructive information on developing efficient study habits. These latter articles are published particularly in the interest of the large number of students enrolled in the Institute who complete part of their training by the school's shop-proved home-study training methods.

Employers, vocational counselors, veteran administrators, and other interested persons

who would like to receive a copy of Skilled Tradesman should write to E. C. Anderson, Manager, Commercial Trades Institute, 1400 W. Greenleaf, Chicago 26, Illinois.

BAKER OPENS NEW PLANT

THE Baker Ice Machine Co., Inc., announce the opening of its new factory at South Windham, Maine, where they will soon be in full production of compressors and condensing units in sizes from $1\frac{1}{2}$ to 15 hp for both ammonia and Freon.

The location of the new Baker factory on the Presumpscot River a few miles from Portland, Maine was recognized as early as 1740 as an ideal industrial site. To all outward appearances, it is a typical New England textile mill nestled beside its mill pond. That is what it was.

Today, inside, it is a modern, spacious, well-lighted plant, complete with machine tools for high-precision production and the finest testing, assembly and shipping facilities. Maine workmen are craftsmen by centuries-old tradition and a selected group of them will apply their skills to the production of Baker equipment. The same mill pond which powered the original mill today supplies electric power through a plant of the Central Maine Power Company. A convenient railroad siding brings raw materials and speeds shipments.

So the South Windham factory will indeed bring finer equipment and better service to all Baker contractors and users.

HONEYWELL OPENS NEW OFFICE

STEADY growth of agriculture and industry in the San Joaquin Valley area of California has led to the opening of a new branch office of the Minneapolis-Honeywell Regulator Company to service the territory. C. L. Peterson, Pacific regional manager, has announced.

The office is located temporarily at 1357 N. Street, Fresno, until permanent quarters can be obtained.

Clyde N. Bradley, until recently in the San Francisco office of Honeywell, has been appointed district representative for the company. A graduate of the University of Oklahoma, he joined Honeywell in 1944. During the war he was associated with the Lockheed Aircraft Company in a technical capacity. He previously was employed by the Shell Chemical Company.



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Additional personnel will be added to the new Fresno office soon, Peterson said. Recent scientific advances in the processing and packing of agricultural products, together with an increasing demand for domestic, industrial and commercial heating and air conditioning equipment in the Valley area were responsible for the decision to broaden the company's activity in the prosperous region, he said.

Chicago Office Moves

The Chicago regional office of the Minneapolis-Honeywell Regulator Company and its industrial division, the Brown Instrument Company, has moved to a new location which will provide three times as much space as former quarters.

Fred Kaiser, manager, said the move was necessary because of the big increase of Honeywell and Brown business in the Chicago territory. The new office, at 351 East Ohio Street, occupies the entire top floor of the building and provides 30,000 square feet of floor space.

The Chicago regional office supervises activity and branch offices in various cities of Wisconsin, Illinois, Michigan, Indiana, Kentucky, Tennessee, Missouri, Arkansas, Kansas and Iowa.

NEW CATALOGS AND BULLETINS

HASCO, Inc., Greensboro, N. C., have available an 18-page catalog listing new refrigeration parts available from the company and parts that are re-operated and repaired. Included in the catalog are many small parts for hermetic units, such as valve reeds and valve plates.

AUTOMATIC PRODUCTS CO., Milwaukee, Wis., have just issued seven new catalog inserts covering the products manufactured by them. The products covered by the inserts are Model 204 automatic expansion valve, Model 205 thermostatic expansion valve, Model 206 thermostatic expansion valve, Model 207 thermostatic expansion valve, Models 215K and 220K thermostatic valves, the Trap-Dri, and Model 66 solenoid water valve.

JACK & HEINTZ PRECISION INDUSTRIES, Inc., Cleveland 1, Ohio, have now available the first issue of RCU 5000, Jack & Heintz Condensing Unit Data. It is written in a condensed style, containing only essential service data for quick, complete reference. The manual includes an illustrated spare

parts list, electric motor service stations, and brief service data.

REFRIGERATION SERVICE, Inc., 3109 Beverly Blvd., Los Angeles 4, Calif., now have available their catalog No. 17. It is a 112-page book of refrigeration parts, supplies and accessories, and provides complete information on refrigeration and air conditioning parts, including the latest part numbers and latest prices. Contained in the book are a number of yellow pages of special priced bargain items. Copies may be obtained from the wholesaler.

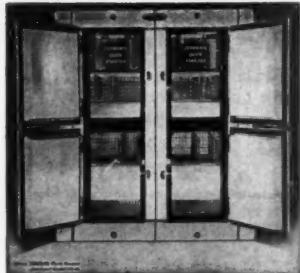
AMERICAN COIL CO., Newark, N. J., have a new illustrated catalog just issued covering the two complete lines of Latenaire and Sensaire air conditioning units designed by the company. Included in these Amcoil lines are remote and self-contained models of both the floor and wall types, as well as duct-type coil for use in conjunction with any forced air conditioning system.

Specifically built for use in warm, humid climates, Latenaire units utilize a patented vapor-pressure differential method by which air is properly cooled and dehumidified in one operation without the necessity of chilling it to the dew point. The moisture content of the air controls the capacity of the self-adjusting Latenaire, which uses up to 45% of its total capacity for moisture removal and 55% for sensible cooling.

Sensaire units are distinctly designed for comfortable air conditioning in warm, dry climates. They work on the operating principle of the conventional type of forced-air cooling unit. By forcing the air directly through the cooling coil 30% of total capacity for moisture removal and 70% for sensible cooling is obtained.

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Complete specifications and engineering data for all Latenaire and Sensaire models will be found in this new catalog. It also includes a handy new air conditioning calculator chart for use in selecting the correct model and capacity for individual conditions, eliminating the necessity for the usual "slide-rule" engineering. Copies will be sent without obligation by writing to American Coils, Inc., 360 Thomas Street, Newark 5, New Jersey.



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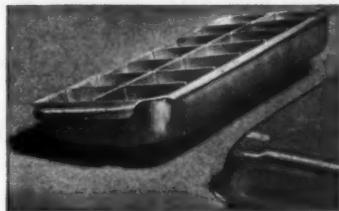
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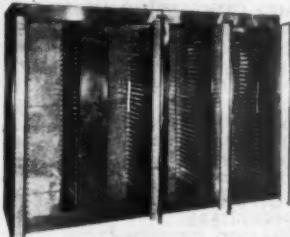
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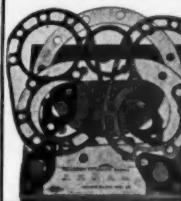
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... these **WHITE-RODGERS** controls have a
reputation for staying on the job

Neat and attractive as well as accurate and dependable, these White-Rodgers controls are the first choice of refrigeration installers and service men. Because automatic refrigerating and air-conditioning equipment can operate only so well as the controls that make it work, be sure you always use White-Rodgers controls. More and more refrigeration and air-conditioning equipment manufacturers have standardized on White-Rodgers controls because they know they're better. White-Rodgers Electric Company, St. Louis 6, Missouri.



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